

FRITZ J. FRANK
President

J. H. VAN DEVENTER
Editor

C. E. WRIGHT **J. A. ROWAN** **A. I. FINDLEY**
Managing Editor *News Editor* *Editor Emeritus*

R. E. MILLER **F. J. WINTERS** **T. W. LIPPERT**
Machinery Editor *Art Editor* *Metallurgical Editor*

Associate Editors
F. J. OLIVER **W. A. PHAIR** **G. RICCIARDI**
F. JURASCHEK
Consulting Editor

Washington Editor
L. W. MOFFETT

Resident District Editors
T. C. CAMPBELL **ROBERT G. BINGHAM**
Pittsburgh *Chicago*
D. R. JAMES **W. F. SHERMAN**
Cleveland *Detroit*

Editorial Correspondents
F. B. RICE-OXLEY **ROBERT G. MCINTOSH**
London, England *Cincinnati*
G. FRAZAR **P. FIDRMUC**
Boston *Hamburg, Germany*
L. E. MEYER **CHARLES POST**
Milwaukee *San Francisco*
F. SANDERSON **ASA ROUNTREE, JR.**
Toronto, Ontario *Birmingham*
LEROY W. ALLISON **ROY M. EDMONDS**
Newark, N. J. *St. Louis*
F. T. TURNER
Buffalo



Owned and Published by



CHILTON COMPANY
(Incorporated)

Publication Office **Editorial and**
Chestnut and 56th Sts., **Executive Offices**
Philadelphia, Pa. 239 West 39th St.
New York, N. Y.

OFFICERS AND DIRECTORS

C. A. MUSSELMAN, *President*
FRITZ J. FRANK, *Executive Vice-President*
FREDERIC C. STEVENS, *Vice-President*
JOSEPH S. HILDRETH, "
GEORGE H. GRIFFITHS, "
EVERIT B. TERHUNE, "
WILLIAM A. BARBER, *Treasurer*
JOHN BLAIR MOFFETT, *Secretary*
JOHN H. VAN DEVENTER
JULIAN CHASE
THOMAS L. KANE
CHARLES S. BAUR
G. CARROLL BUZBY
P. M. FAHRENDORF



C. S. BAUR, *General Advertising Manager*
A. H. DIX, *Manager Reader Service*



Member, Audit Bureau of Circulations
Member, Associated Business Papers
Indexed in the Industrial Arts Index.
Published every Thursday. Subscription
Price: United States and Pos-
sessions, Mexico, Cuba, \$6.00; Can-
ada, \$8.50; Foreign, \$12.00 a year.
Single copy, 25 cents. Cable Address,
"Ironage, N. Y."



ADVERTISING STAFF

Emerson Findley, 621 Union Bldg., Cleveland
B. L. Herman, Chilton Bldg., Chestnut & 56th
Sts., Philadelphia, Pa.
H. K. Hottenstein, 802 Otis Bldg., Chicago
H. E. Leonard, 239 W. 39th St., New York
Pelree Lewis, 7310 Woodward Ave., Detroit
C. H. Ober, 239 W. 39th St., New York
W. B. Robinson, 428 Park Bldg., Pittsburgh
D. C. Warren, P. O. Box 81, Hartford, Conn.

THE IRON AGE

Contents

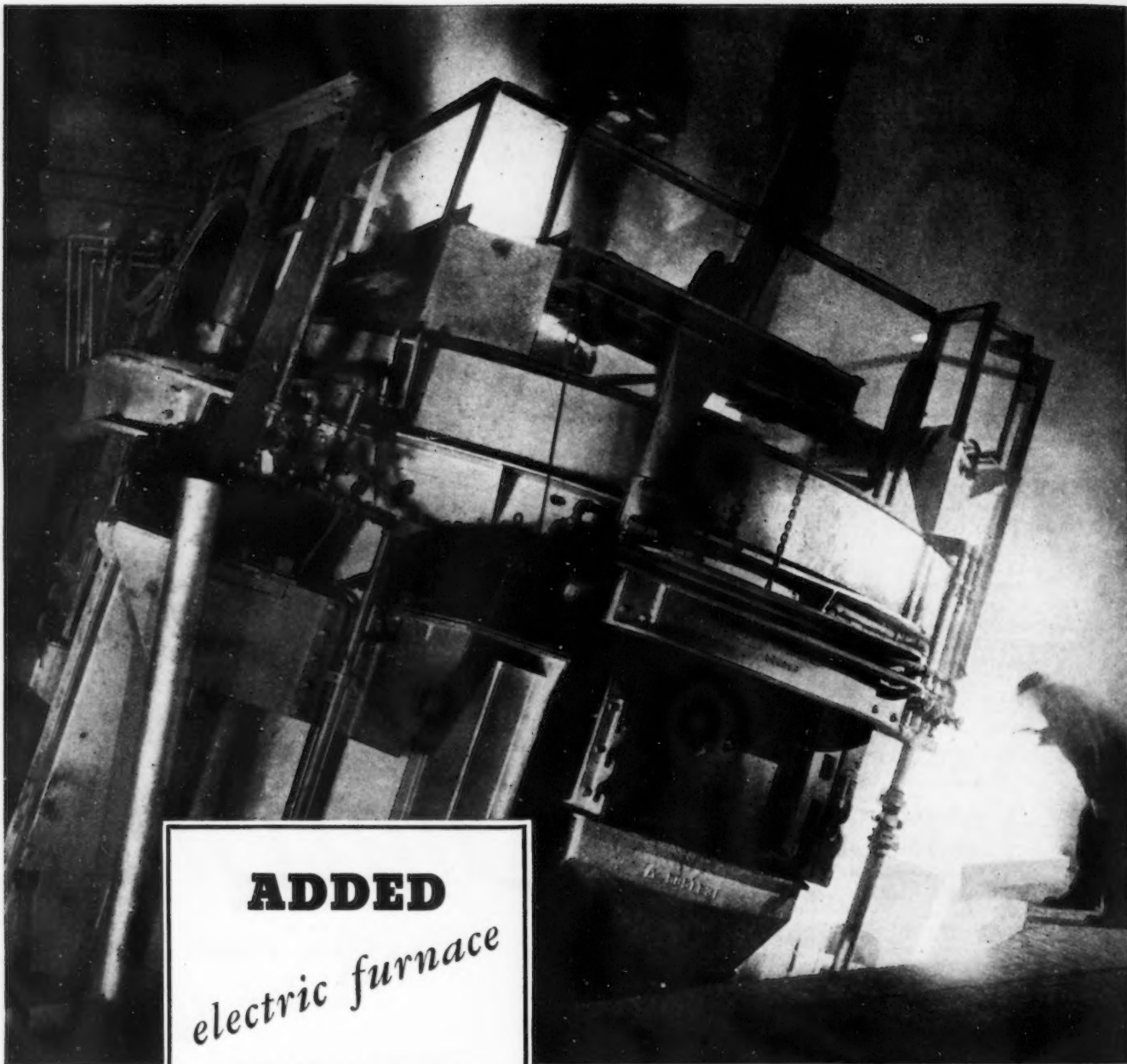
MAY 19, 1938

The Magic Carpet	23
Accuracy in Cutting High-Speed Reduction Gears	24
A Review of Recent Machine Tool Advances	28
Drums Along the Conemaugh	34
Economic Problems of Belt Selection	38
Automotive Industry	42
Washington News	46
THE NEWS IN BRIEF	54
Rate of Activity in Capital Goods	66
Plant Expansion and Equipment Buying	87



New Industrial Literature	89
Just Between Us Two	96
Products Advertised	99
Index to Advertisers	122

Copyright 1938 by Chilton Company (Inc.)



ADDED
electric furnace
CAPACITY

enhances Bethlehem service to alloy steel users

ANOTHER ELECTRIC FURNACE is now in operation in the alloy division of Bethlehem Steel Company's Bethlehem, Pa., Plant. This increases Bethlehem's annual capacity for alloy and tool steels by approximately 18,000 tons.

Operated by men who have the intuitive skill that comes only from long experience, Bethlehem's modern facilities are geared to your needs by a metallurgical staff having an intimate acquaintance with the problems of alloy steel users.



BETHLEHEM STEEL COMPANY

▲▲▲ THE IRON AGE ▲▲▲

MAY 19, 1938

ESTABLISHED 1855

Vol. 141, No. 20

The Magic Carpet

THE production of steel sheets is a fascinating spectacle. This is especially true of hot strip sheet as it ripples from the continuous mill with the speed and color of a magical flying carpet.

One who observes the speedy and apparently never ending output of sheets or strip from a modern mill may well ask the question: "Where does it all go?" The automobile industry, of course, takes the lion's share of it, using, last year, a little more than 40 per cent of the 11 million tons of sheets and strip that was produced. Even so, that leaves nearly seven million tons which has gone into other products or other purposes.

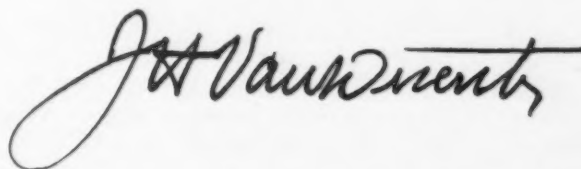
Eleven million tons is a lot of steel. Converted into 24-gage sheet of 48-in. width, it would make a steel ribbon long enough to form an endless belt extending from the earth to the moon and back again.

The length of this magic carpet has been stretching year after year as uses have multiplied. Last year's output of 11 million tons was more than twice that of the boom year of 1929 and five times that of 20 years ago. In those early days only one ingot out of every 20 produced went into these flat rolled products. A decade ago it was one ingot in every 10. Last year it was one in every five.

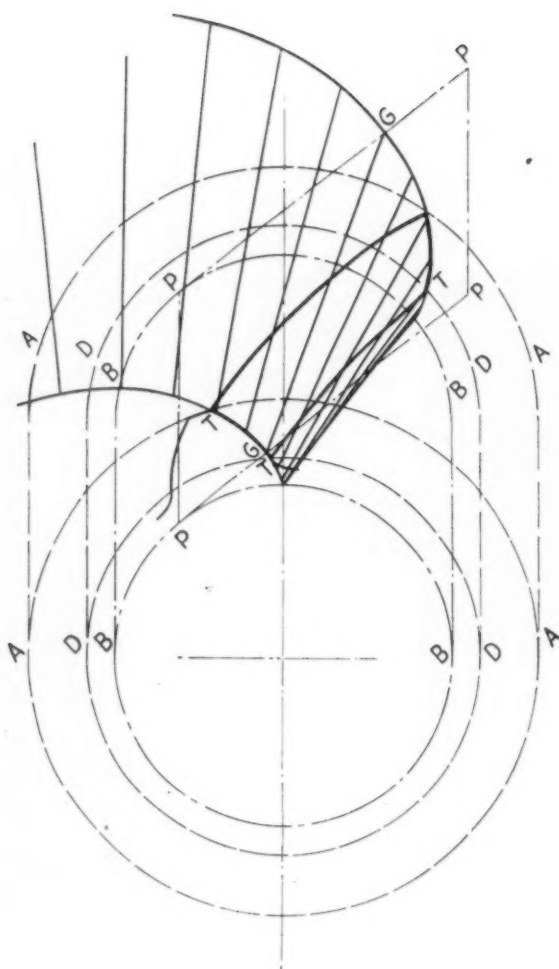
This magic carpet is the fastest growing product of the steel industry, because of its versatility of application. It will continue to grow proportionately in the future and even perhaps at a faster rate, as thousands of as yet unexplored avenues of use become surveyed and opened.

By far the larger part of the huge sums that have been spent by steel makers for modernization of plant and equipment during the past 10 years has gone into mechanisms for making the magic carpet. It has been a wise investment and one which anticipated correctly a demand that was progressing geometrically.

Mechanization of magic carpet making in the steel industry has conferred substantial price benefits upon the consuming public. On the basis of the price reductions effected since 1918, last year's output meant a saving to the customers of 576 millions of dollars. Such savings should be direct additions to our American consuming power. Unfortunately they are neutralized by the increasing demands of the tax collectors.



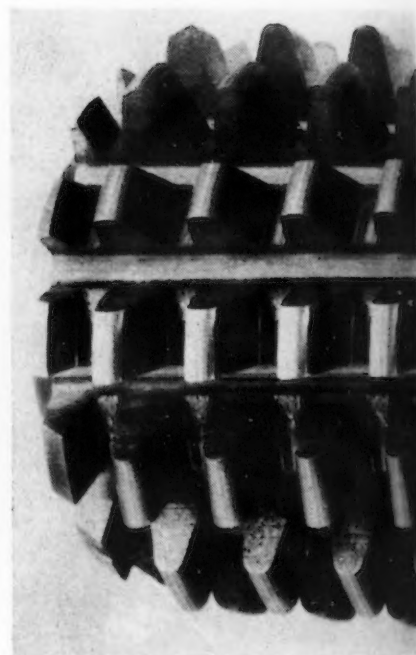
Accuracy Essential in Cutting



(AT LEFT)
FIG. 1—Generation of the helical involute surface.

(AT RIGHT)
FIG. 2—Hob used in hobbing process.

(LOWER RIGHT)
FIG. 3—Gear hobbing machine.



By **HAROLD W. SEMAR**
Mechanical Engineer, Westinghouse Electric & Mfg. Co., South Philadelphia, Pa.

THE production of high speed turbine reduction gears calls for a high degree of accuracy in the machining of the tooth surfaces. In order to maintain the accuracy required of the gear cutting machines, elaborate tests and measuring instruments are used to maintain the accuracy of each element of the gear

cutting machine to insure precisely finished gear teeth.

Nearly all high speed gearing is of the double-helical involute type. Sections through the gear teeth at right angles to the gear axis are involute curves so that the kinematics of the helical involute gear is similar to that of the involute spur gear. The helical gear tooth surface can be considered as a series of involute curves disposed along a helix on the pitch cylinder of the gear.

A better conception of the tooth sur-

face, which will make its geometry more easily understood, is shown in Fig. 1. The involute surface is there shown as the path of the straight line *GG* in the plane *P* as the plane is unwrapped from the base cylinder *B*. The tooth surface of an involute gear is made up of that part of the involute surface contained between the addendum cylinder *A* and the dedendum cylinder *D*.

Most gears are cut by the hobbing process. The cutting tool or hob (Fig. 2) is, in effect, a single tooth helical involute gear. The single tooth, which is of the nature of a thread, is gashed and relieved to form cutting edges so that of the original involute surface only the cutting edges remain.

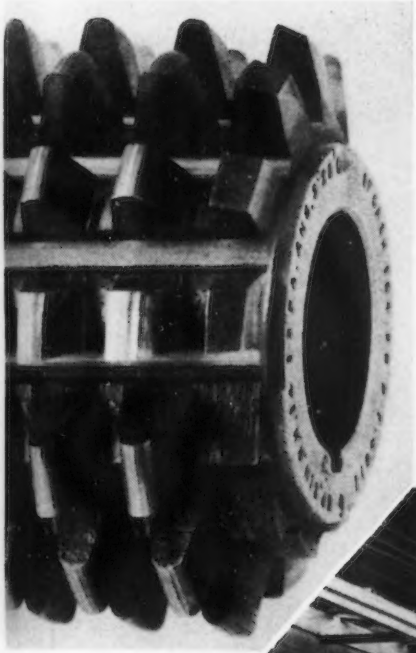
The Hobbing Process

Fig. 3 pictures a hobbing machine of vertical type. The blank is clamped

High-Speed Reduction Gears—I

HIGH speeds together with the necessity for quiet operation call for extreme accuracy in cutting the reduction gears used with modern steam turbines. Methods employed by the Westinghouse company to maintain both their hobbing machines and hobs in a condition to assure the necessary accuracy of gear cutting are outlined in this series of two articles:

In this first part, Mr. Semar discusses briefly the tooth surface characteristics of the helical gears employed, and the operation of the hobbing machine and hob in producing these tooth surfaces.



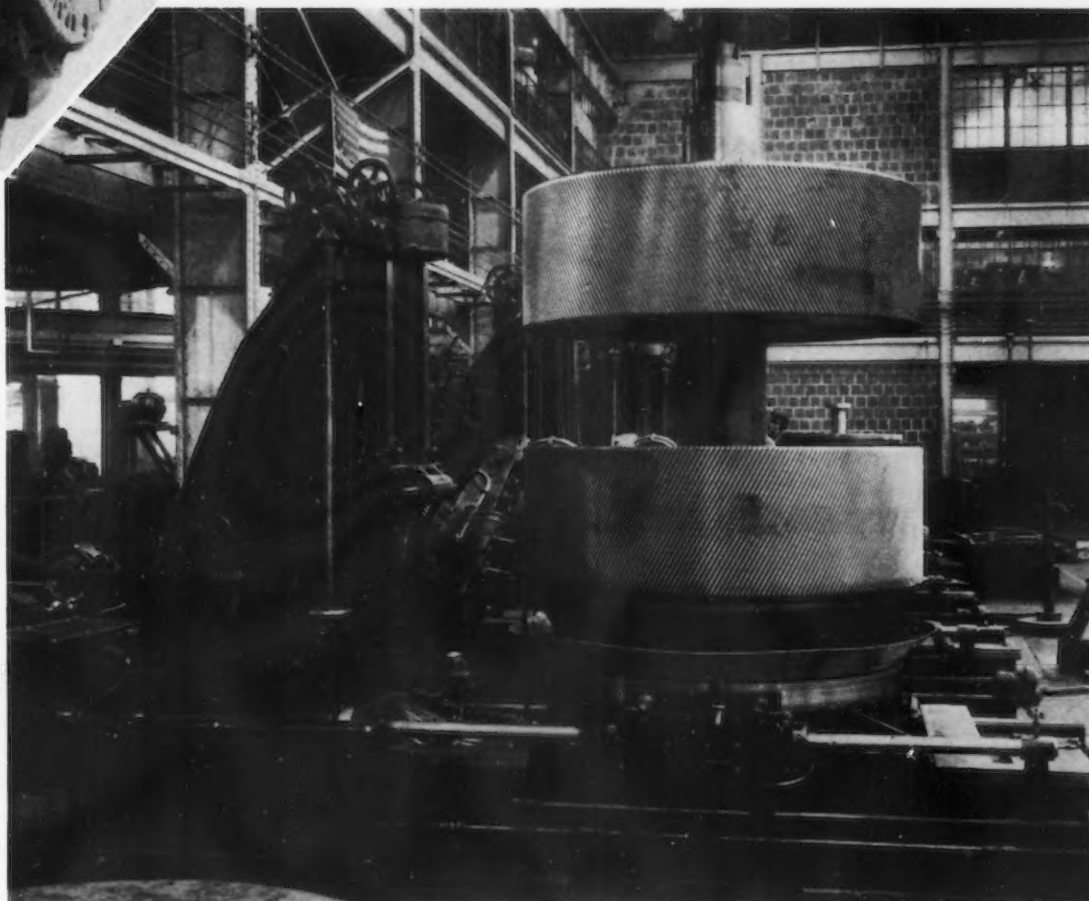
gearing within the machine. In one complete revolution of the blank, the hob makes a fraction of a revolution more than the exact number of teeth being cut in order to produce the helix angle. The amount that the hob gains is such that a complete revolution is gained as the hob advances one axial

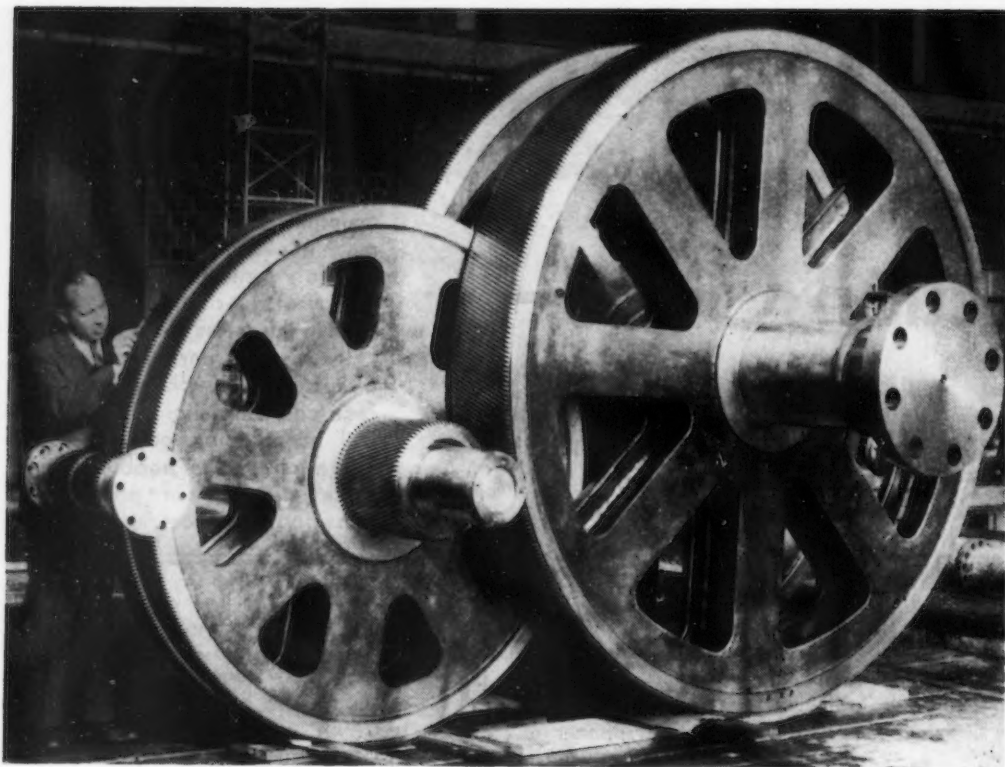
pitch. The hob thread is set at an angle which coincides with the helix angle of the blank so that the hob teeth will travel in a direction parallel to the teeth of the blank. The actual helix angle, however, is determined by the gearing of the machine.

Two or three traverses of the face

to the work-table, and the teeth are cut as the hob rotates in a fixed relation to the rotation of the blank. The hob is fed continuously downward during the cut, advancing from 0.030 to 0.060 in. during each revolution of the blank until the entire face width is traversed.

The rotation of the blank and hob and the downward movement of the hob are interconnected by





(AT LEFT)
**FIG. 4—Double re-
duction rotating ele-
ment.**

(AT RIGHT)
**FIG. 6 — Enlarge-
ment of generated
tooth surface.**

width are made to complete the cutting of the teeth. The pinion teeth are produced by a similar machine. A finished gear in mesh with its pinion is pictured in Fig. 4, and in Fig. 5 is drawn a development of the pinion tooth surface.

Character of Generated Tooth Surface

By its generation (Fig. 1), it can be seen that the surface is made up of a series of straight lines tangent to a helix. In Fig. 5, this helix is represented by the arc *BB*, the addendum and dedendum by the arcs *AA* and *DD* respectively, and the pitch diameter by the arc *PP*. The surface shown in Fig. 5 is a true development of the helical surface and all points on it are in their exact relation to each other. The straight lines *GG* in Fig.

5 (a) are generating lines and are tangent to the helix *BB*.

The line *m* Fig. 5 (b) represents the path described by the hob teeth in a single pass of the hob over the tooth surface. On the next revolution, the hob will sweep over the line *n*. By continued sweeps, the whole tooth is formed. The lines *m*, *n*, *o*, etc., are feed lines, their spacing depending on the rate at which the hob is fed downward.

Ridge Left on Surface

If the hob is considered to be made up of a very large number of cutting edges so that its thread would be more nearly continuous, the feed line would be a continuous curve and lie entirely in the involute tooth surface. The hobbled surface between the feed lines, however, does not lie exactly in the in-

volute surface but slightly above it so that a ridge is left on the hobbled surface midway between the feed lines.

A much enlarged portion of the tooth surface in the region of the pitch line is shown in Fig. 6. Section *XX* along the pitch line shows the ridges midway between the feed lines much exaggerated. The ridges of a height *x* represent the departure of the generated surface from the theoretically correct surface and are of the order of 0.00005 in. with the coarsest feed used.

Cutting Action of the Hob

The hobs actually used have, instead of a very large number, about 12 cutting edges in each revolution. The feed lines, instead of being perfect curves, are made up of a number of lines equal to the number of hob

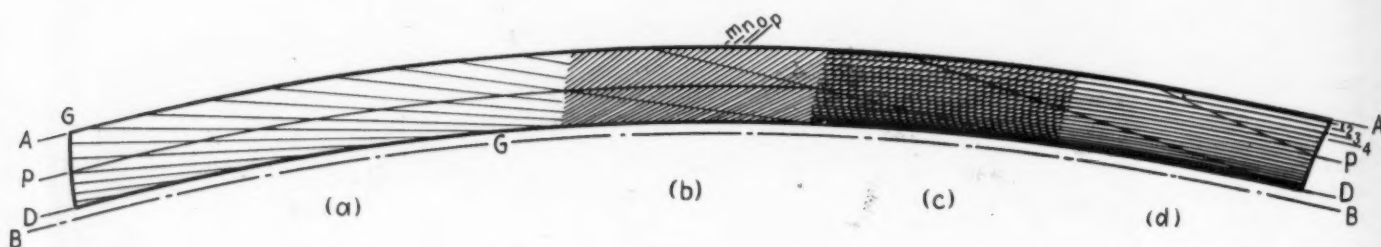


FIG. 5—Generated tooth surface.

teeth with which it is formed. The lines 1, 2, 3, etc., Fig. 5 (d), represent the positions on the surface which are contacted by the hob teeth 1, 2, 3, etc. The intersections of the lines *m*, *n*, *o*, etc., with the lines 1, 2, 3, etc., Fig. 5 (c) mark the points at which the cutting edges of the hob exactly touch the theoretical involute surface.

Section YY of Fig. 6 shows how the tooth curve is approximated by successive cutting edges. A second series of ridges is thus formed by the hob lines which cross the series of ridges formed by the feed lines. In this case, the ridges rise a maximum *y* of 0.00005 in. above the involute surface with the largest teeth used in turbine gearing.

The ridges between the feed lines and the ridges between the hob lines mark the boundaries of the facets which make up the generated tooth surface.

If the cutting action of the hob could produce an optically smooth surface, the boundaries of the facets

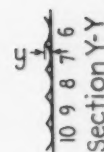
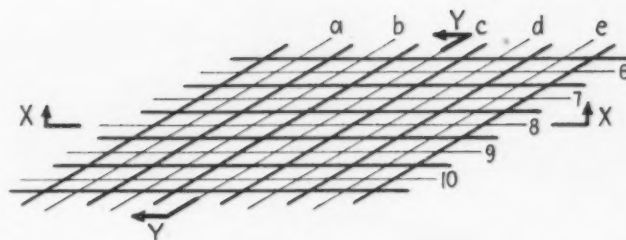
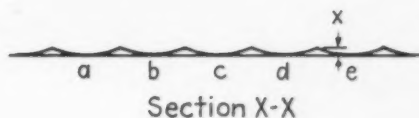


FIG. 6
SEE PAGE 26



could be seen and the tooth surface would appear as in Fig. 6. However, the magnitude of the ridges which mark the departure of the generated surface from the true involute surface, being of the order of 0.00005 in., is such that the boundaries of the facets are obscured by the microscopic irregularities of the machined surface

and cannot be detected even by most careful measurement.

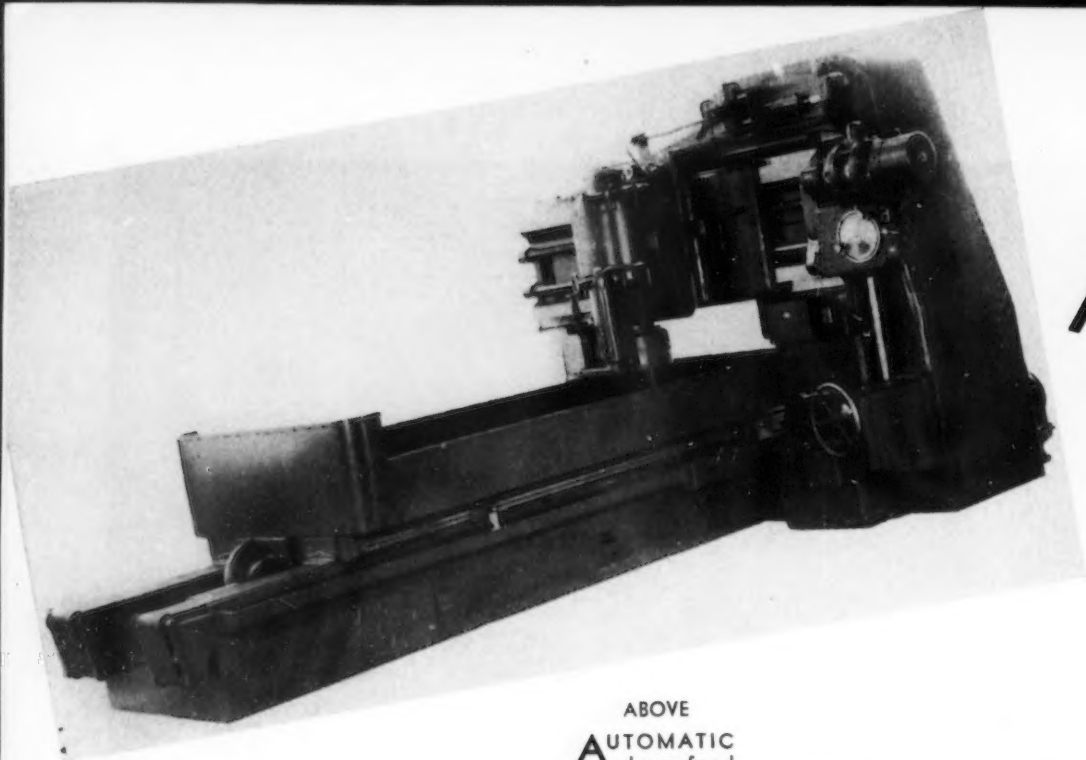
Practically then, the hobbing process can be considered as producing a perfect involute surface, and any measurable departures from the true surface will be caused by inaccuracies in the machine elements.

(TO BE CONCLUDED)

A 15-TON tractor and bulldozer was recently utilized to extend the piling area for steam coal at the Bethlehem plant of the Bethlehem Steel Co. With the aid of a platform the bulldozer is also used to reload the coal for consumption. While the bulldozer has been chiefly utilized in handling barley-size anthracite, which is the Bethlehem plant's main source of steam coal, experience has indicated that it can be applied to piling coking-size bituminous coal with equal efficiency. Under average conditions the bulldozer is capable of piling or loading barley-size anthracite at the rate of about 80 tons an hr.



A Review



ABOVE
AUTOMATIC down feed and cross feed are provided the 25-hp. grinding wheel head on this huge Hanchett planer type surface grinder, with a table area 50 x 120 in.

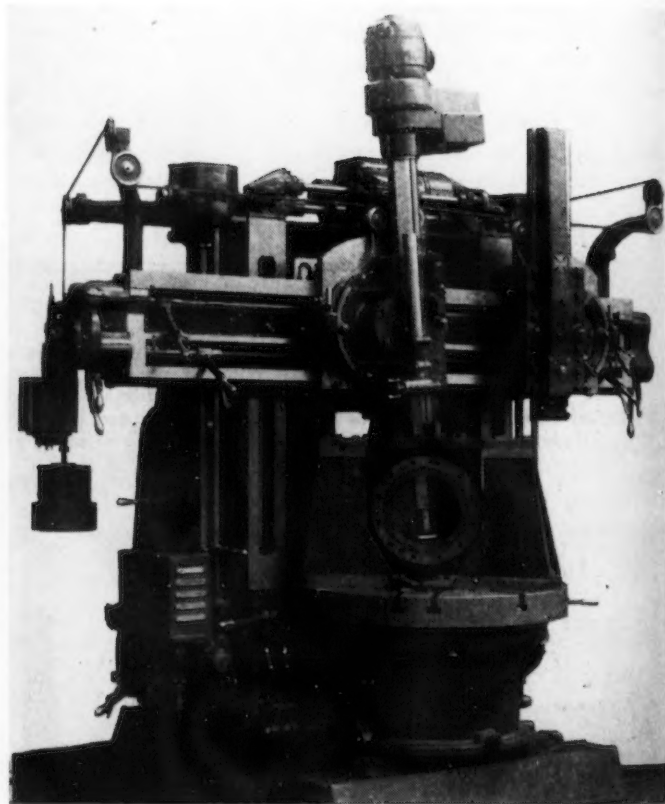
WHAT is probably the largest machine of its type that has been built and offered to the trade is a new vertical spindle planer type surface grinder, made by the Hanchett Mfg. Co., Big Rapids, Mich. The finished work table top measures 50 x 120 in. and the distance under a new grinding wheel is 20 in. This wheel is a segmental type, 18 in. in diameter and 6 in. high, with 1½ in. face. The wheel head is provided with automatic down feed in increments of 0.002 to 0.003 in., automatic cross feed in steps of ⅛ to 5 in., and constant cross feed at the rate of 30 ft. per min. for rapid traversing. Power elevation of the cross rail is at the rate of 3 ft. per min. Automatic clamping is applied at both housings.

Including motors for the coolant pump and the forced feed lubrication for the ways, there are six motors that drive this machine. Besides the 25-hp. motor for the grinding wheel proper, there are separate motors for the hydraulic pump, for cross feed of the grinding wheel head and for elevating the cross rail assembly. This huge machine weighs approximately 85,000 lb. and occupies a floor space of 160 x 350 in.

Profile Cutter Grinder

George Gorton Machine Co., Racine, Wis., has brought out a machine for grinding small cutters (of

AT RIGHT
SHOWN grinding a valve body is an auxiliary grinding head replacing the left-hand head on a standard Cincinnati 48-in. vertical boring mill.



not over ⅝ in. shank) such as are used in die and mold cutting and pantograph engraving and profile work. The unit was especially designed for grinding the highly efficient single-flute cutters, which are difficult to grind on standard types of cutter grinders. This No. 375-2 grinder when equipped with a universal tool head will grind cutters to any desired taper, shape or clearance, and with square, conical or ball nose. An index dial and plunger are provided for grinding tools having from one to

four sides or flats. There are micrometer dials on all adjustments.

Straight cup wheels are furnished for single-flute grinding, flaring cup wheels for multiflute cutters, and diamond impregnated wheels for carbide tools. The universal fixture is carried on a counterbalanced rocker arm. Spindle is ball bearing equipped.

Grinding Head for Boring Mill

Although originally designed to fit the needs of a specific customer, an

of Recent Machine

By FRANK J. OLIVER
Associate Editor, *The Iron Age*

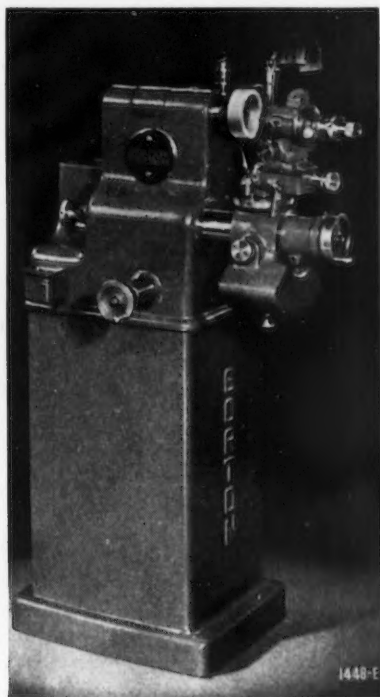
Tool Advances . . .

interesting development of a grinding head arranged to fit a standard boring mill is now being offered as a regular unit by the *Cincinnati Planer Co.*, Cincinnati. This self-contained grinding attachment replaces the left-hand head on the 4-ft. size mill. The drive to the grinding wheel is by a two-speed Texrope box upon which the driving motor is mounted. The grinding wheel quill can be had in

various lengths and diameters for the particular hole size required. It is supported in the lower end of the hollow octagon ram which is fitted with precision bearing to support the drive shaft.

Both feed and rapid traverse move-

ments are available, and in addition, there is a hand operated truing device for adjustment for height and wheel diameter. Vertical feeding of the grinding wheel is controlled through dogs mounted on the ram. At the upper end of the stroke another



ABOVE

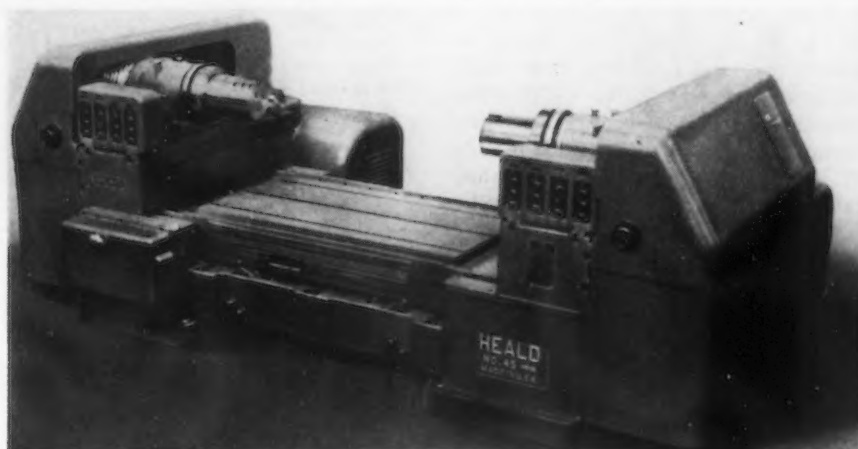
THE Gorton cutter grinder No. 375-2 is designed particularly for sharpening single-flute cutters and other small types of engraving cutters, not over $\frac{3}{8}$ -in. shank.

AT RIGHT
ADJUSTMENT of the regulating wheel slide of Cincinnati Nos. 2 and 3 centerless grinding machines to compensate for wheel wear or to keep the work within specified tolerances is facilitated by this indicator attachment.



BELOW

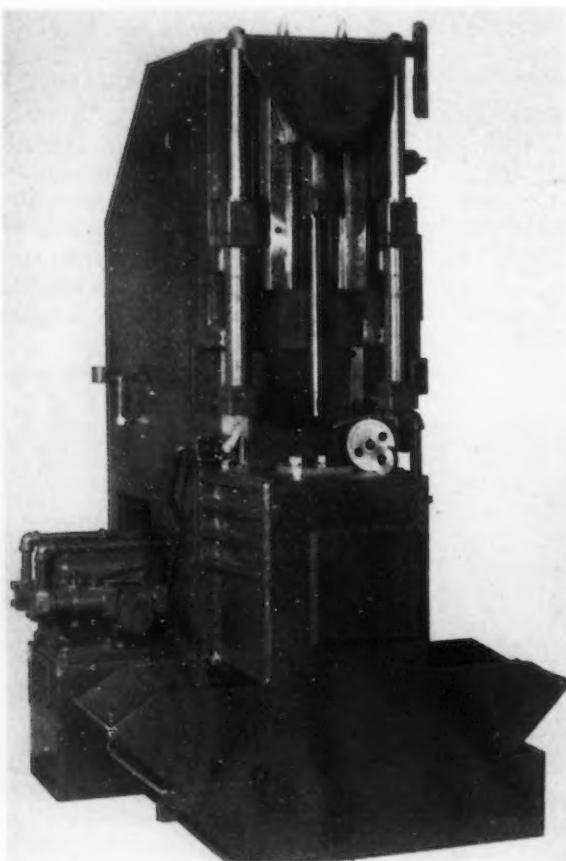
THE new No. 45, largest of the Heald Bore-Matics, is a massive machine for precision boring large, heavy work, such as lathe head-stocks.



dog operating in conjunction with a limit switch imparts a horizontal feed movement, varying from 0.0005 to 0.004 in. per stroke. To "spark out," this horizontal feed can be manually disengaged at any time.

Precision Boring Machine

Heald Machine Co. has added to its line of precision boring machines the largest size yet to be built, the No. 45, designed for boring large machine tool units, such as lathe headstocks and spindle carriers for screw machines.



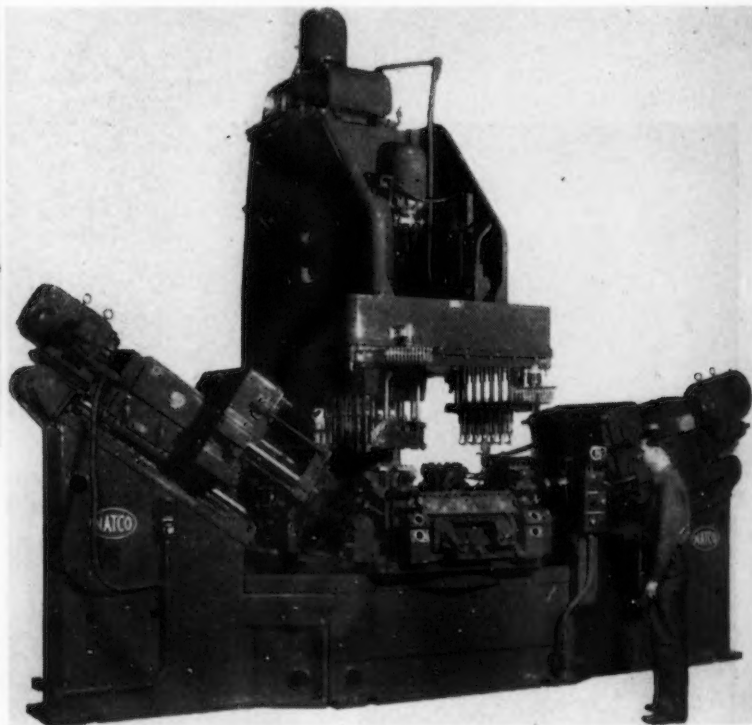
AT LEFT

THIS modified Oilgear 6-ton vertical pull-down broaching machine has a two-stage automatic cycle controlled by push buttons.

o o o

BELOW

THIS Natco five-way combination driller and taper performs 40 operations on automotive cylinder heads.



It can be furnished either single or double end, and the bridges on which the heads are mounted have a capacity from three to seven heads, depending upon their size. Table surface is only 22 in. from the floor and the finished table pad is 54 x 28 in. Table stroke is 30 in., hydraulically actuated.

The boring heads are driven by individual d.c. motors, controlled by rheostat. Drive to the heads is by V-belts from jackshafts on separate sub-bases. Push buttons allow either automatic cycle operation or jogging. Table operation is also controlled by push buttons.

Indicator Attachment for Centerless Grinders

Cincinnati Grinders, Inc., Cincinnati, is offering an attachment for its Nos. 2 and 3 centerless grinding machines to provide a quick and visible method of adjusting the regulating wheel slide. The slide movement is indicated by a 3-in. dial indicator, which is protected by a stop, limiting the movement of the indicator finger, after contact, to a distance of 0.2 in. When this limit is reached, the con-

adjustment to compensate for wheel wear and truing. For the latter operation, the infeed lever is moved down until the indicator gage shows a predetermined reading, and the positive stop is not used in this instance. This attachment may be readily mounted on machines already in service.

Portable Boring Bar

Recently introduced by the *Van Norman Machine Tool Co.*, Springfield, Mass., is a portable boring bar known as Per-Fect-O No. 777 and claimed to be fast, powerful and accurate. It will bore any diameter from 2.600 to 5.343 in. and takes an 0.050 in. cut at any diameter within its capacity. The machine is a complete unit, powered by a 1/2-hp. capacitor motor and has two feeds and two speeds. The heavy duty gears are totally enclosed and lubricated for the life of the machine. Heavy duty tool bits are standard equipment.

Common to the Per-Fect-O line, this No. 777 unit has four non-revolving, expansible catspaws that guide the fly-

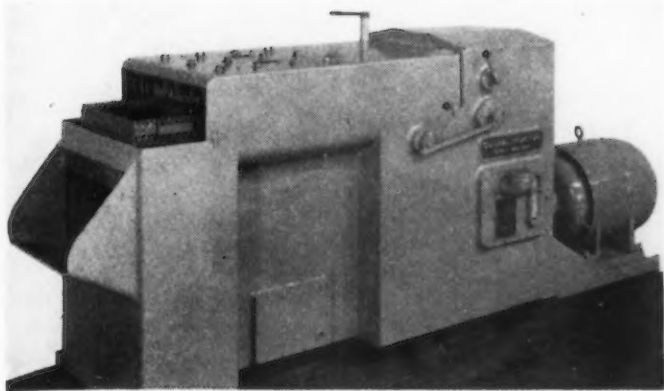
tact dog strikes the stop lug and slides back on a support rod.

The indicator attachment is applicable to both throughfeed and infeed work. For the former operation, it serves as a convenient and accurate

cutter all the way to the bottom of the bore, giving a true cut.

Broaching Machines

A fully automatic vertical pull down broaching machine for sizing the



o o o

AT LEFT

3 000 pieces per hr. is the output of this special 4-ton Colonial machine for broaching two flats on hydraulic brake couplings with dual tools.

o o o

Broaching two flat surfaces on more than 3000 steel hydraulic brake couplings per hour is the unusual job performed by a special high speed horizontal hydraulic broaching machine, made by *Colonial Broach Co.* There are two sets of stationary broaches, permitting simultaneous broaching of two pieces on each stroke. The two flats must be in correct angular relation to the hexagon on the coupling, and the loading apertures are hexagon shaped to guide the parts as they drop into the machine, which is fully

BELOW

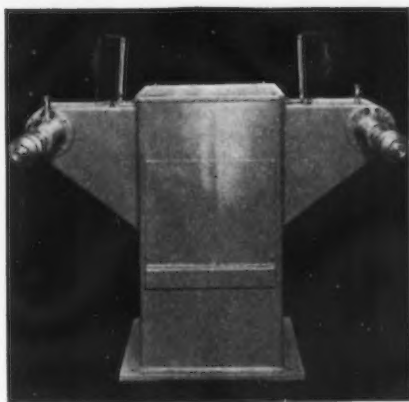
TYPICAL cross-section of a flat and V-way section of a Monarch lathe treated by the flame hardening process. Surface Brinells up to 590, greatly improving the wear resistance.



holes in timing gear blanks has been developed by the *Oilgear Co.*, 1301 W. Bruce Street, Milwaukee. This unit has a hydraulically operated tool handling slide and an automatic lower broach puller, so that all the operator needs to do is lay the work flat on the platen and press a push button. The tool slide moves down, threading the tool shank through the work until it enters the pulling socket, when the main slide and automatic puller take hold. At the end of the stroke the operator removes the finished piece and pushes another push button to complete the cycle. The main slide and tool rise until the tool engages the "detent" in the upper tool slide, at which point the main slide stops and the tool handling slide continues upward to the loading position.

Cams on both slides can be adjusted to suit the stroke required. An Oilgear two-way variable delivery pump supplies fluid power for both slides, and the cutting and return speeds of the main slide can be adjusted independently. All piping and control mechanisms are enclosed in the frame, which is of all-steel welded construction. The normal capacity is 12,000-lb. pull and 18,000-lb. peak. The maximum stroke is 24 in. and the cutting speed 4 to 35 ft. per min. with return speed up to 60 ft. per min.

IN point of number, grinders again lead in this review of announcements made by the machine tool builders in recent weeks. What is probably the largest vertical surface grinder is described, also a machine for grinding small tools. A new departure is the application of a grinder head to a vertical boring mill. Another grinder development is an indicator attachment for centerless grinders. Two special application broaching machines are described, indicating how far automaticity is being pushed for this class of work. Other machines described include a portable boring bar of wide range, a huge combination driller and taper, tube and bar straightener for work with upset ends, a new size of cold sawing machine, and a quadruple threader of wide application. Outside the strictly machine tool field is a large size helve hammer.



ABOVE

THE Crown Rheostat & Supply Co., Chicago, has designed a polishing lathe so that as many as four men can work in a floor space of only 55 x 48 in. Machine is driven by two motors in the common base, and the two spindles may be of different speeds.

o o o

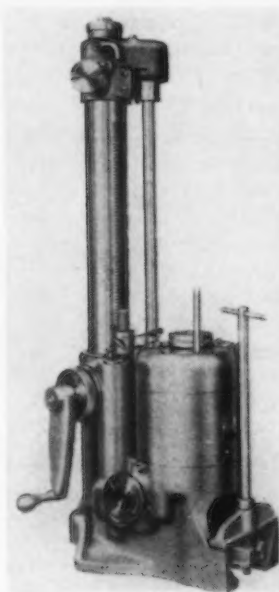
AT RIGHT

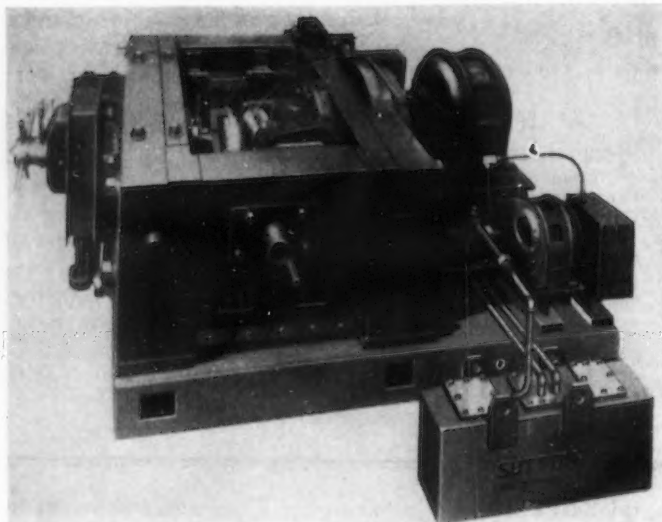
THE new Van Norman No. 777 heavy duty boring bar has a diameter range from 2.600 to 5.343 in.

enclosed. As they feed into place for broaching, the couplings are gripped by spring loaded hexagon shaped jaws.

Broaches Readily Removable

Hardened and ground guide rails contact the part on the bottom and sides during its travel, so as to main-





AT LEFT

THERE is an automatic release on the idler roll of this single cross-type Sutton straightener for rods and tubes with upset ends.

able to take care of different sizes and working presses. This roll is also adjustable longitudinally, parallel to the pass line.

The chief feature of this machine is the automatic release of the idler roll to permit the upset ends of the bars or tubes to pass through. This release is actuated hydraulically, by means of a solenoid-operated valve, the circuit of which is closed by a finger at the entering end of the machine. The roll is brought into the

tain vertical and horizontal alinement. The stationary broaches themselves are arranged in sub-bars, permitting ready removal in sections. Standard Colonial hydraulic operating units are used. The cycle is set to give a broaching speed of 45 ft. per min., with a return speed of the ram of twice that.

Combination Driller and Tapper

The *National Automatic Tool Co.*, Richmond, Ind., has recently built a special machine for automotive cylinder head work, in which there are three Natco "Holeunits" and two individually driven tapping units. This machine drills, counterbores, chamfers and taps the six spark plug holes, spotfaces the intake and exhaust holes, and drills and taps two small holes in the end of a cast iron cylinder head, performing a total of 40 operations. Production is 90 heads per hour, and only one operator is required.

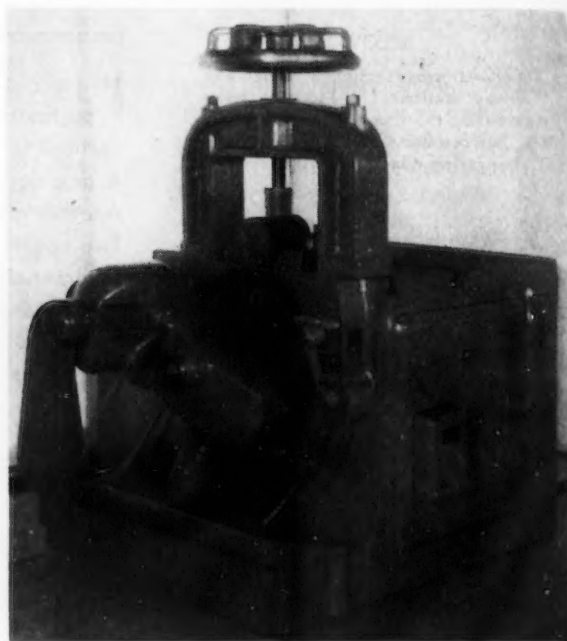
The vertical spindle box contains 12 drilling spindles and six tapping spindles complete with individual lead screws and tap holder and driven by an auxiliary reversing motor. Similarly, the horizontal tapping unit is mounted on the back of the right-hand Holeunit. Mounted on the steel pedestal is a 44-in. diameter four-position hydraulically indexed table on which is mounted a fixture holding four heads. This machine weighs 65,500 lb.

Flame Hardened Lathe Beds

Lathes made by the *Monarch Machine Tool Co.*, Sidney, Ohio, may now be had with the flat and V-way portion of the beds hardened to a uni-

AT RIGHT

THE new 8-in. Porter-McLeod cold metal sawing machine is of a swing frame design with a type of drive that literally pulls the saw through the work.



form depth of $\frac{1}{8}$ in. or more by the flame hardening process. After finish planing, the bed is immersed in a water tank and the way surfaces subjected to a traveling oxy-acetylene flame, refining and condensing the grain structure. Brinell hardness runs up to 590. Casting strains are not imposed by this method, and the bed is later ground to a fine finish. Lathes with maximum bed length of $13\frac{1}{2}$ ft. can be furnished with this feature at small additional cost.

Bar and Tube Straightener

One of the most recent developments of the *Sutton Engineering Co.*, 1209 Park Building, Pittsburgh, is a single cross-type straightening machine for round bars and tubes with upset ends. In this design there is one driven roll with one opposed idler roll, both having concave contours. They are angularly adjustable to give proper deflection for straightening and the idler roll is laterally adjust-

pressure position by means of a push button.

Cold Sawing Machine

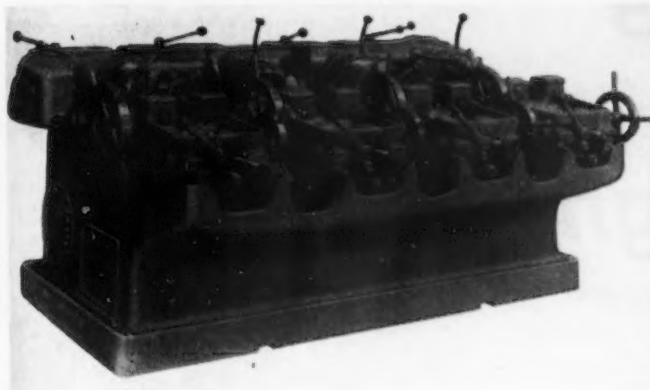
A new 8-in. size cold metal sawing machine has been developed by the *Porter-McLeod Machine Tool Co., Inc.*, Hatfield, Mass., for general work and for production work in single or multiple units. This machine is of the swing frame type with the work mounted above the blade. The blade-carrying swing frame fulcrums on a bushing in the main frame and an outboard support. This frame is also supported at its quadrant end where the feed is applied through a double helical pinion and gear sector driven through a friction disk to prevent blade breakage when hard spots are encountered.

The saw blade is of the Higley type and is mounted on an idler shaft, the drive being by a sprocket that engages radial slots in the blade well out from the center. The blade is literally

pulled through the cut and is supported on both sides at the drive point, thus eliminating weaving and buckling. Drive of this sprocket is through

bearings are employed throughout on all gear shafts and the main spindle is mounted on a pre-loaded anti-friction bearing at the die head end. The

guides are covered by telescoping steel guards which protect them from chips and in addition, wipers are provided at the rear of the carriage.



AT LEFT

THE Landmaco quadruple head threading machine is suitable for jobbing and maintenance work, as well as high production runs, since each die head may be set for a different diameter.

a spiral bevel pinion and ring gear, driven by double helical gears and silent chain from a 5-hp. motor.

On the standard machines with the 20-in. blade, the working speed is 53½ ft. per min. Feeds may be adjusted from 0 to 3 in. per min. Clamping of the work may be either by handwheel and screw or hydraulically.

Quadruple Head Threader

The new Landmaco quadruple head threading machine made by the Landis Machine Co., Inc., Waynesboro, Pa., offers four threading units assembled on a single bed. This machine is particularly adaptable to jobbing and maintenance work, especially in railroad shops, where it may be desirable to set each die head on a separate diameter, thus eliminating the necessity for frequently changing the chasers. Eight threading speeds are provided through a selective gear box. Provision is made to equip the left-hand spindle with a reverse taper die head, found particularly useful for threading taper head radial crown bolts. Center to center distances are comparatively short and one man can conveniently operate the machine.

Unlike the four spindle semi-automatic Landis threader previously described (THE IRON AGE, Jan. 13, p. 42), the vise on this Landmaco unit is closed manually, instead of automatically, and the carriage and vise advances to the threading die, whereas in the semi-automatic machine the die head advances to the work. The range of work may be from ¼ to 1 in., inclusive, or from ½ to 1½ in.

Gears are of chrome-nickel steel, hardened and burnished. Anti-friction



ABOVE

THE Hanna speed control valve, made in ¾, ½, ¼ and 1-in. pipe sizes, is designed to regulate the admission and exhaust of air to or from each end of an air cylinder, independently of the other end, so as to give practically constant speed irrespective of the manipulation of the operating valve. This is a product of the Hanna Engineering Works, Chicago.

Large Helve Hammer

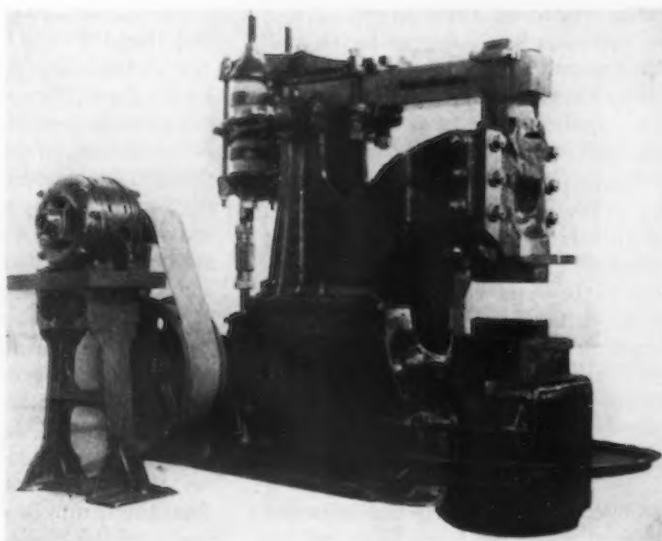
For general industrial, railroad shop and shipyard use, C. C. Bradley & Son, Inc., Syracuse, N. Y., is offering a new 500-lb. upright helve hammer. The machine has a standard speed of 175 blows per min. and produces an impact of 1600 ft.-lb. per stroke, which is adequate for forging down billets up to 8 or 8½ in. in cross-section. The hammer designation of 500 lb. relates merely to the weight of the head.

The guided head of these hammers is adjustable, a feature emphasized as assuring the production of accurate forgings. Equipped with impression dies having control pins, these machines are said to have been successful in forging many parts to a tolerance of plus or minus 0.005 in. It is further stated that equipped with progressive dies, this hammer has produced with economy small, lightweight forgings usually made in hammers of other types. Many forgings are produced without flash.

Construction is rugged throughout. The main bed and anvil block are made of cast iron and the majority of other castings are of steel or semi-steel. Important also is the use of banks of rubber cushions which serve not only to accentuate the force of the blow and to speed the return of the head, but also to eliminate vibration at drive shaft and motor. Adjustments are provided for quickly changing the point of impact of the hammer, and for varying the length of stroke.

AT RIGHT

A 500-lb. helve hammer is being offered by C. C. Bradley & Son, for forging billets up to 8 or 8½ in. in cross-section.



Drums Along the Conemaugh

By JAMES A. ROWAN

News Editor, *The Iron Age*

HOW a democracy functions in these times of danger to democratic forms of government interests most Americans.

But nowhere in the United States is there more interest in democratic government and its functioning than among the boys and girls who belong to the Civics Class of Franklin Boro High School, near Johnstown, Pa., the city of floods.

And so when the National Labor Relations Board let it be known that a hearing on the alleged illegality of Bethlehem Steel Co.'s Plan of Employee Representation (the plan another U. S. agency, the National War Labor Board of 1919, suggested and set up) was scheduled to be held in the Franklin Boro High School, the Civics Class students and their teacher saw opportunity in large chunks coming their way.

While the coming event wasn't as big an event as the Johnstown flood or the famed Whisky Rebellion of western Pennsylvania history, it promised to be—and certainly turned out to be—a first rate chance to observe democratic government as typified by the National Labor Relations Board functioning, one might say, at close range.

Knew of Buck and John L.

Collective bargaining the boys and girls of Franklin Boro High School

had heard about. The CIO and SWOC they had heard about. Buck Rogers and Charley McCarthy they knew about. John L. Lewis they had heard about almost since childhood, since coal mines gaped out of the good earth all about Johnstown and coal union meetings under the direction of Mr. Lewis' United Mine Workers have long been common occurrences. Likewise, swing music and Mae West are understood and appreciated at this school along the Conemaugh.

Of the National Labor Relations Board the Franklin Boro students knew very little except what they had been told and had read, but often it is what boys and girls see for themselves that they remember longest.

For instance, there was the day Labor Board Examiner Frank Bloom, delegated to hear the Board's Wagner Act case against Bethlehem Steel Co., plugged his fingers in his ears when the Franklin Boro school boys' band—an organization very strong on the bass horn side—blasted out "The Stars and Stripes Forever."

NOW it wasn't "The Stars and Stripes Forever"—it wasn't the musical composition itself that gripped Mr. Bloom, it was the earnestness with which the composition was played. It seemed a coincidence, however, that the Franklin Boro boys' band, heavy on the bass horn side, seemed to

practice frequently when Labor Board Examiner Bloom was bending his best judicial efforts to the problem of deciding whether to call the whole thing off, and recommend to the Labor Board that the Bethlehem Plan of Employee Representation be kicked out the window, or whether to continue with the case, bass horns or no bass horns, steel company attorneys or no steel company attorneys.

History Will Decide

Not in the memory of the oldest resident had any Johnstown judge stuck his fingers in his ears, but customs change and the Civics Class of Franklin Boro High School is not so narrow minded that its members will not accept changes of customs in collective bargaining, or in the use of judges' ears. But they will remember the incident, and whether democracy or the Labor Board lost or gained by it is difficult to tell.

When Earl K. Shawe, one of the young Labor Board attorneys doing what critics call his bit for John L. Lewis and the CIO, fell off his chair on the back of his head, literally, to prove a point, the boys and girls of Franklin Boro High School who had chosen to visit the Labor Board hearing rather than the nearest picture show were greatly impressed.

More interesting if perhaps more technical was a controversy in which witnesses, hangers-on and most everyone in the school building took part. This concerned the problem of whether or not to postpone the Bethlehem hearing over last Good Friday. Such a postponement, some of the steel company attorneys felt, was a reasonable thing to expect but Chief Examiner Bloom ruled otherwise. No holiday for Good Friday in his court, Mr. Bloom decided.

To be fair to Mr. Bloom it is necessary to report that later he judiciously ruled that neither would the hearing be postponed for next Yom Kippur, a decision which even a Labor Board critic could see, was right down the middle of the road and of the stuff of which democracy is made.

WHAT to do about the school parades, which do not provide an ideal background for Labor Board examiners to judge coolly and fairly regarding an issue between employee and employer, was something that had Examiner Bloom stumped. Even under the Wagner Labor Relations Act as it now stands, a labor board examiner is without power to disestablish a high school or any other school be-

cause their hands are too heavy on the bass horn side or for any other reason.

A Job for the Janitor

If it wasn't a parade, or a band practice interfering with the dignity and so on of the Labor Board's Johnstown hearing, it was something else, such as the auditorium lighting system which annoyed practically everybody except the boys and girls of the Franklin Boro Civics Class who were there to see democracy (still personified by the Labor Board Examiner and his aides) operate without regard for the light in which the system was shown.

The Franklin Boro High School, monumentally built out of steel company taxes, boasts of some other things but not of its lighting system and the school authorities, particularly the janitor, who felt a direct responsibility, were said to be invariably embarrassed when the stage light shining on the Bethlehem attorneys turned Russian red. At other times the Franklin auditorium lighting system gave Examiner Bloom himself a purple nose and young Mr. Shawe, the labor board attorney (who is also a University of Virginia man) frequently turned green as he spoke because that was the way the Franklin Boro High School lighting system worked. And there were other colors. When the janitor tried to turn the lights to pure white, all the lights went out, and the audience kicked on the floor as they do in the mid-West when a movie film gets on fire.

Something Really Important

Since the seeker after facts about the Labor Board hearings at Johnstown—where more than 80 per cent of Bethlehem plant employees recently indorsed the Plan of Employee representation in their own election—must search for what is really important in building up a public understanding of just how the Labor Board hearings are run he cannot overlook Mr. Bloom's kidney.

Examiner Bloom's kidney, the Franklin Boro High School Civics Class was politely interested in learning, is not all it should be. Most everyone has something wrong with him and with Mr. Bloom it is his kidney. Observers, without the slightest evidence to back up their claims, hold that Mr. Bloom's kidney worried him most when the Bethlehem attorneys brought up some point which seemed embarrassing to John L. Lewis' SWOC, the plaintiff in the case.

A kidney attack gave Mr. Bloom

CAN COMMUNISM AID DEMOCRACY IN AMERICA?

**Tune in or attend this big Buffalo Town Meeting of the Air!*

SAM ABBOTT— Erie County Speakers:
and Organizer, Communist Party

PROF. HORTON— History Dep't, University of Buffalo

at COURT ST. THEATRE
SAT. FEB. 26, 1938

Discussion starts at 8:30 P.M.
at 9 P.M. and lasts until 10 P.M. over Radio Station
W.B.E.N. and W.E.B.R. Broadcasting begins

ENLIVENING the campaign to unionize steel workers in Buffalo area is the above notice, appearing in "Steel Sparks," a publication distributed from district Communist party headquarters, room 12, 75 1-2 West Chippewa Street, Buffalo. (Shortly THE IRON AGE will look at the steel labor situation in upstate New York's largest city in "We The Communists," by James A. Rowan, IRON AGE news editor.)

time to cogitate, or to check by telephone with Dr. David Joseph Saposs, the Board's chief economist, or some of the higherups in the Labor Board organization at Washington, the observers (unable to prove it) said.

TO a man of Mr. Bloom's kidney the rather doubtful relevance of some of the testimony introduced by his own attorneys, helped by the SWOC, was not always apparent—another point which the Franklin Boro Civics Class members who happened to be at the hearing will remember with interest. There was the day that the Labor Board attorneys brought on a witness in an attempt to prove that a Bethlehem superintendent was practically a hangman or at least a man who advised people to go hang themselves.

John Ignots, a former Bethlehem employee representative but now somewhat of a star witness for the SWOC in the drive to upset the Bethlehem Plan of Employee Representation, recently electrified the Labor Board hearing by declaring that Ralph E. Hough, assistant general manager of the Cambria plant, had said that "he (Ignots) should have a rope around his neck."

Quick to deny Mr. Ignots' charge and mindful of the talk such a charge would cause, Mr. Hough, an amiable-appearing man, testified that he once saw Mr. Ignots "in a precarious position on a scaffold." He warned Ignots of the danger and declared that the worker should not climb without a safety belt or rope around him, according to Mr. Hough who held that the word "neck" was not mentioned.

Mr. Golden's Life Story

While the Civics Class of Franklin Boro High School could see that the rope testimony possibly merely emphasized differences in points of view, the announcement that Clinton S. Golden, SWOC regional director (and a Commonwealth College man, see "Mr. Koch Comes to Town" in THE IRON AGE of April 21) was to appear at the hearing as a witness was universally acclaimed. Mr. Golden, who once described a freight train as "the voice of capitalism trying to drown out the voice of labor" (he himself was making a speech), was and is a bigwig in the SWOC and his appearance in Johnstown was an occasion.

On the day that Mr. Golden was to appear the SWOC-Labor Board forces



TO refute the usual claims by the Labor money to finance the Employee Representatives at Bethlehem Steel Co.'s Johnstown plant, the check pictured above to show that they pay their to Cipe Brothers, Johnstown, for printing the don Ross and Clare H. Williams, officials of other check, also drawn by these officials on hem Steel Co. for ballot boxes, voting lists

had everything rigged, that is, fixed up so Mr. Golden would be presented to the best advantage. Here was no roundheeled labor skate but a man who represented class and symbolized dignity in the labor organizing profession.

One hundred and twenty-five persons, an unofficial count, including some school children, filed into the school auditorium and observed that the witness chair had been elevated to give it the effect of a throne. A microphone, a rarity in courtrooms, had been brought in—theretofore every speaker had thrown his own voice—and set up in front of Mr. Golden. A supply of pencils and paper rested on the press table and the table itself was pushed close to Chief Examiner Bloom's chair so that Mr. Bloom, if he were so inclined, could lean over and see who was taking down notes and who wasn't (a matter of curiosity and not a move to control the freedom of the press).

ALMOST immediately the microphone, an anti-union device apparently, began to heckle Mr. Golden, who is an extraordinarily sensitive man, just as he launched into his life story against the noisy objections of the Bethlehem attorneys that this story had nothing to do with the case.

Mr. Golden's full-toned words were sharpened by the microphone and hurtled back at him in a sort of laryngitic screech, sounding little like the "Voice of Labor," and the Franklin Boro Civics Class members could get little out of it.

Coupled with the unusual lighting effects which harass any speaker at Franklin school, the back-firing microphone is said to have pushed the hearing into a panic. Outside, the big bass horns and the big bass drums of the Franklin Boro High School were banging away. A freight shuddered down the Pennsylvania railroad's main line tracks along the Conemaugh River. A street car stumbled uncertainly around the school. In this knock-knock atmosphere, Mr. Golden was one of the first to crack but Board Attorney Leonard Keller leaped to his assistance, Keller said:

Or Whatever It Is

"May I suggest that this loud speaker attachment or public address system, or whatever it is, be removed." Examiner Bloom inserted: "Is that what is making the noise" and then added hoarsely, "Oh, let's take it down." And the microphone was taken down.

One of the first voices heard after the excitement was that of Hoyt A. Moore, Bethlehem chief counsel, who asked Examiner Bloom "if handbills had been sent out advertising Golden's appearance."

This opened up a dog fight in which Labor Board Attorney Keller called Mr. Moore's remarks concerning advertising for Golden as "scandalous" and "purely gratuitous."

Here Bloom and Golden got into an argument about the relevancy of Mr. Golden's life story which the SWOC executive still wanted to tell and into another dispute over whether Mr.

Golden should answer Mr. Moore's questions.

"Just because you were a Labor Board official (Golden once was Labor Board manager in the Pittsburgh area), you can't refuse to give testimony in this court," bellowed Mr. Bloom who, as a pretty good lawyer, probably knows as well as anyone whether the Labor Board hearings are "judicial" and "unbiased."

But Mr. Golden, who as the Civics Class and everyone else could see, was in a rather unsettled frame of mind, with his back turned stubbornly on the Bethlehem attorneys, said he wouldn't talk and he didn't talk, except when he wanted to.

AS the assistant to Philip Murray, SWOC chairman, and as a friend of John L. Lewis, Mr. Golden has a great deal of influence with the Labor Board, and the Franklin class could see that he probably knew what he was doing. They figured that probably Mr. Bloom got an earful of something or other when next he called the Labor Board headquarters at Washington. When Mr. Lewis' name was mentioned in Mr. Golden's presence, the SWOC official clearly showed his respect and at one time he testified thus:

Question—"Will you tell me some member of the CIO?"

Mr. Golden—"John L. Lewis."

Question—"Is he a corporation or an individual?"

Mr. Golden—"I don't know."



Board-CIO forces that others put up the sentation Plan, leaders of Employee Repre-town plant exhibit canceled checks like those own bills. The check at the right was drawn March election ballots and is signed by Gor-the Employee Representation Plan. The a Johnstown bank, was used to pay Bethle-and rent for the organization's headquarters.

All could see that whether Mr. Lewis is a corporation in his own right was a question which Mr. Golden was willing to let someone else answer. Of his own life story he was willing to talk and over the protests of the steel company attorneys he placed the following lines into the testimony.

On Business for Brookwood

"I joined the Brotherhood of Locomotive Firemen and Enginemen, I think, around 1904. In 1906 I was elected a grievance committee man. Some time later, I don't recall just when, I was elected general chairman of the system grievance committee. I participated in the work of that organization for a number of years. I left the railroads in 1916 to work in the shops as a machinist. In 1919 I was elected district representative for the machinists union in Philadelphia. I held that position for upwards of three years.

"Then I was appointed a representative of the Amalgamated Clothing Workers Union. I was with that organization for several months. Then I was appointed business manager and field representative for Brookwood Labor College at Katonah." (Katonah is in New York's fashionable Westchester County.)

How Johnstown is taking these things, such as the story of Mr. Golden's life (which the Bethlehem attorneys had kept to barely thumbnail proportions) is hardly a matter for argument. It seems clear to a visitor

that the town, except for the children at Franklin Boro High School, have taken the hearings calmly. If attendance is taken as an index to public approval, this particular unit of the Labor Board's road show should be closed.

Mr. Bloom Wants Results

Even when the hearing was shifted to the Hotel Hendler, over near the Lehigh station, attendance did not improve, and if the Johnstown workers are anxious to kick out the Plan of Employee Representation and join up with the Labor Board's favorite organization, the SWOC, the town doesn't show it. Whether "Big Poison" Paul Waner can continue forever to hit 400 for the Pittsburgh Pirates seems more important. Even though the Board bills its hearings and Examiner Bloom, one of the ablest Labor Board examiners, is said to coach his two young assistants and give them merry hell when they miss a cue to discredit the Employee Representatives organization, the hearing can't begin to compete with nearby two-feature picture shows.

Last summer's calling of a strike at Johnstown by the SWOC evidently was a blunder because it turned out that even with some 15,000 coal miners in the district to keep the 15,000 steel workers from their jobs, there just weren't enough union members to support a strike.

THIS year the SWOC didn't even take the trouble to put up a slate in the Employee Representatives elec-

tions although last year the SWOC men fought hard to have their men elected to office in that organization so as to overturn it. To illustrate the good works of the ERP, Clare Williams, the organization's chairman, reports that it gave \$900 for flood relief. The SWOC, he said, contributed \$25.

While a year ago, prior to the independent steel company strikes, the SWOC pickets and organizers jeered the anti-SWOC workers, this spring things have changed. Now the ERP leaders scorn the SWOC members for being the Labor Board's water carriers. Some Lewis unionists scurry regularly to carry Mr. Bloom's luggage. By merely looking thirsty Mr. Bloom has a pitcher of ice water pushed into his hands. Bloom's assistants get almost as much attention from anxious-to-please unionists as the chief examiner himself. All of which in other courtrooms might look something like greasing a judge's palm with an apple.

Possibly the fact that the average Johnstown steel worker has been with Bethlehem Steel Co. 12 years, goes to one of the city's 87 churches, and has as good a chance as any one of eventually getting onto the membership roles of the Sunnysanna Golf Club; high on the hills above the Conemaugh River, has something to do with the slowness of Johnstown to take fire. Those most impressed by developments in the Labor Board hearings have been the Franklin Boro High School boys and girls . . . and they'd rather tap drums, blow big bass horns and parade.

The Economic Problems of

CHAPTER 31 of a Series on the Economics of Power Transmission Methods and Equipment.

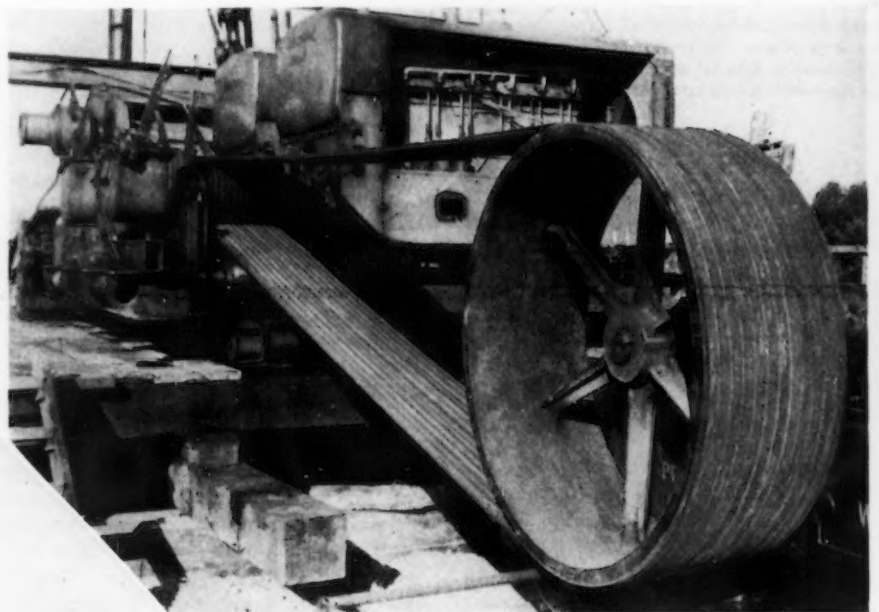
o o o

WHEN it is remembered that belting is one of the oldest as well as most universally used mediums of power transmission, it is rather more than passing strange that practically no literature exists on the subject of the *economics* of belting usage. A great deal of writing, some quite superficial in nature and some very profound, has been done on the subjects of the differences between one type of belting and another, and of the engineering data concerned with the applications of this, that, and the other type of belting to specific types of work. But as to the fundamental economics of belt selection, the data, principles and opinions formulated by the tens of thousands of men who

have made, sold and used belting are, where they exist today at all, locked up in the minds of a small number of successful belting salesmen, and an even smaller number of competent industrial power transmission engineers.

Personally, I believe that if a more widespread knowledge of the economic values of transmission belting had been made available to the buyer of

power transmission equipment, there would not have been such a rush to apply the direct-drive electric motor to every conceivable sort of machine-drive situation during the past generation, and that more careful analyses of drive problems everywhere would have proved earlier what the industrial engineer is now discovering: that belting has a definite place in the



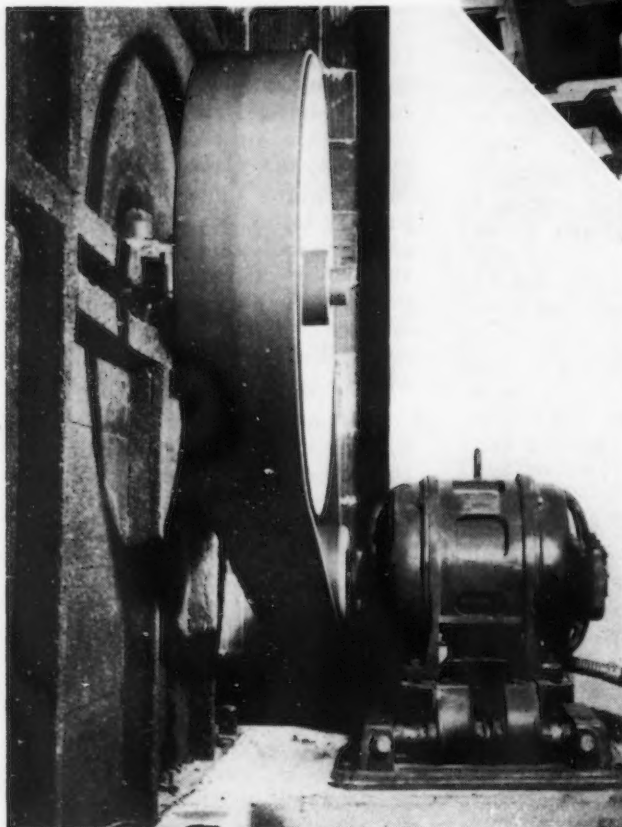
ABOVE

12 CONDOR V-belts (Manhattan Rubber) on an open air Wilson-Snyder slush pump drive in an oil field. Power is supplied by two Caterpillar Diesel engines hooked together.

o o o

AT LEFT

A J. E. Rhoads & Sons Tannate leather belt driving a large fan supplying cooled air to three floors of a large department store and doing more work than seven other large fans in the air-conditioning system. 50 hp. motor on Rockwood base.



power transmission world, a place which it fills acceptably and economically.

Stanier opens his *Mechanical Power Transmission Handbook* (1936) with these words: "Belting is one medium of delivering a given amount of power at a low cost per unit of time, *which should result*, provided the correct type and size are employed, *in the transmission of power at a low cost per horsepower per year over a long period of useful service.* . . . The function of power belting is to transmit power economically." (The italics are mine.) There he stops, like practically every other writer on the subject; and the rest of the 101 pages which make up the three chapters on belting in his book are entirely concerned with descriptions of various types of belting and to the engineer-

Belt Selection

By FRANCIS JURASCHEK
Consulting Editor, *The Iron Age*

ing data involved in making belting drive applications.

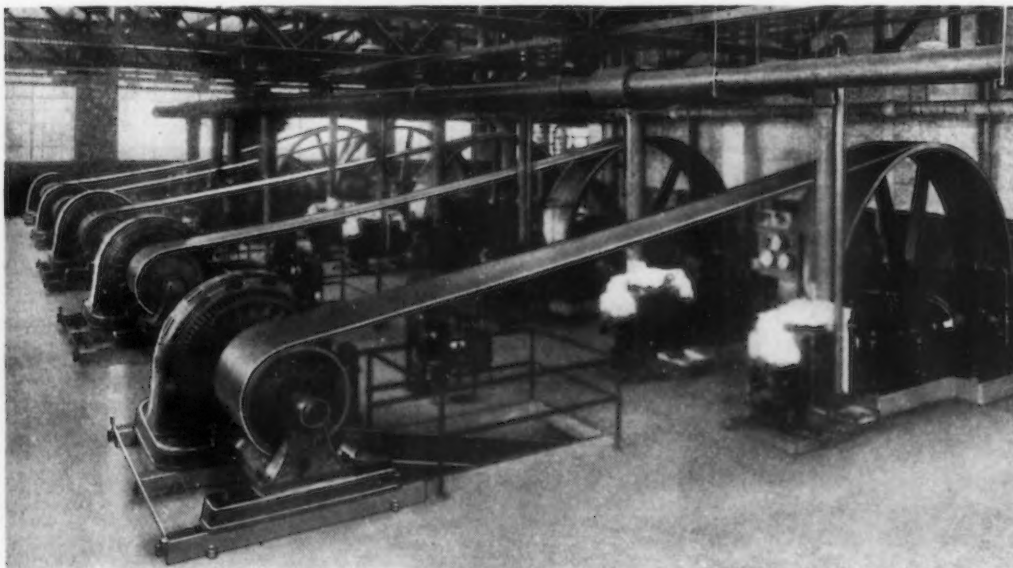
Why should belting be used at all? Other forms of power transmission can usually show greater efficiencies on most applications; that is, they will deliver at any particular moment higher values of power output as compared with power input. From the strictly technical point of view it is

the costs of power transmission. In this approach lies the answer to the question "Why should belting be used at all?"; for under the conditions which are favorable for the use of belt drives, and provided, as Staniar says, the correct type and size are employed, belting transmits power economically at values which result in the most satisfactory performance of the driven

machine during the effective life of that machine.

Hence the economics of belting selection are founded upon three broad factors:

- 1—The conditions favorable for use.
- 2—The selection of the correct type and size.
- 3—The cost of power transmitted



AT LEFT

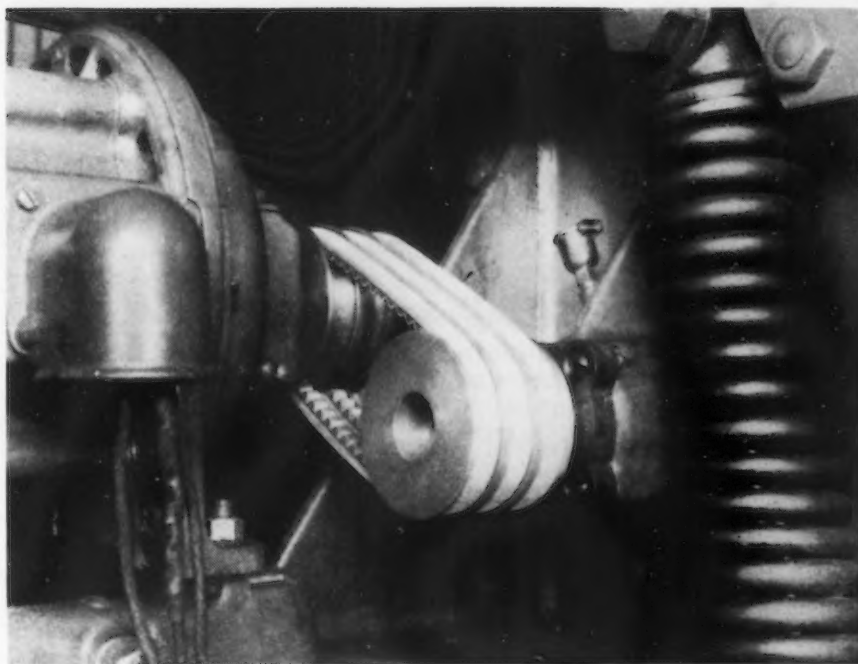
FIVE Chicago Belting Co. Reliance leather belts driving ice machines; three from 500 hp. motors and two from 300 hp. motors. Average transmission cost per delivered horsepower per year for the last 20 years, extremely low.

BELOW

A UNIQUE belting drive is this Dayton triple cog-belt connecting the motor and the driving shaft of a large paper cutter. The center distance between the two pulleys is less than ten inches; the machine load is one of moderately heavy shock.

quite difficult to make out a case for belting drives. Yet belting is still used, and by intelligent plant engineers. The solution of this paradox is a fundamental one, and its roots lie in the realm of economics.

The true cost of applying power to a given machine is *not* the cost as calculated for any specific instant. Time and life-performance are essential elements which cannot be ignored. One must include in the reckoning *all* the factors which are involved in getting the maximum amount of work possible out of the machine during the effective life of the machine. This alters the approach from consideration of the drive as a drive, to consideration of the drive as an element of the driven machine. It is, however, the economic approach to the problem of



during the effective life of the machine.

Manifestly, I cannot attempt to lay down rigid rules to govern any of these three factors as applied to a particular drive problem, nor recommend offhand any positive solution to such a problem. This chapter (and a later discussion to follow) will be concerned with a brief analysis of the most important points to be considered in applying belting to any drive. The special conditions of any particular problem must be met with large doses of common sense.

Pull vs. Push

There are three principal parts to any mechanical power transmission device; the rotating shaft which takes the power input, the rotating shaft which delivers the power output, and the mechanism which transfers the power from the one shaft to the other. It is important to note that *only* in a belt drive is the mechanical effect which is experienced throughout all three parts, a pull. This is so because there is no positive connection between any of the three parts. The pulley on the driving shaft pulls the belt, and the belt pulls the pulley on the driven shaft.

In a chain drive there is both push and pull. The driving sprocket pushes the chain; the chain pulls the driven sprocket. In a direct-coupled shaft one member of the coupling pushes the other; in a gear drive the driving pinion pushes the driven gear. Wherever a connection is *positive*, there must be push. In a hydraulic or pneumatic drive, although there is no positive engagement of parts, the nature of the operating fluid requires the transmission effect to be all push.

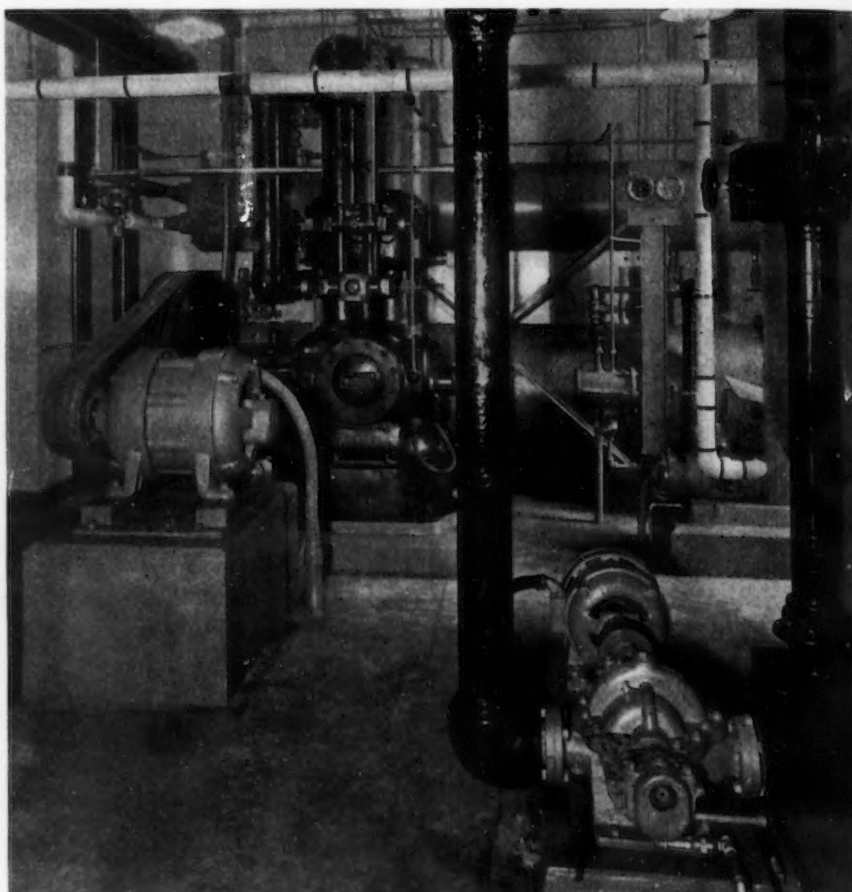
This idea is extremely important; for it is not often realized that between the rotating input and output shafts of any power transmission device there must be a straight-line operating force which is either pull or push; and that the nature of the load and the nature of the power impulse bear significant relations to the question as to whether that operating force should be pull or push.

Loads may be roughly classified as heavy-steady, heavy-broken, light-steady and light-broken. A heavy-steady load may be visualized as the drive from a Corliss engine to a large electrical generator; a heavy-broken load may be visualized as the drive from an electric motor to a large air compressor; a light-steady load may

be visualized as the drive from an exhaust-steam turbine to a small centrifugal pump; and a light-broken load may be visualized as the drive from a lineshaft to a weaving loom. Notice that in each of these examples, the source of power produces a steady, uniform flow.

But the source of power may not produce a steady, uniform flow of

tially a *pull* drive, belting can be used for any of these conditions. A belting drive is a safety device; its resilient characteristics of elasticity and slip tend to absorb or to yield to shock loads, thereby protecting both the driven machine and the driving source. This is completely true only of a type of drive in which the mechanical effect is all pull. Because there is a correct



energy. An electric motor or a large steam turbine comes nearest to that ideal; in a reciprocating steam engine or a multi-cylinder gas or oil engine the individual power impulses do not completely flow together unless there is an extremely heavy flywheel to blend them; in a single-cylinder gas engine the power impulses are definitely felt no matter how heavy the flywheel used.

Consequently the combination of type of load on the driven machine and type of power impulse available may produce a great many variations of drive-load; ranging from the ideal of steady, non-pulsating, non-shock machine-load driven from a smooth-flowing source of power, to the thoroughly aggravating intermittent, heavy-shock machine-load driven from a pulsating source of power.

Because a belting drive is essen-

type and size of belt to meet any of these conditions, belt drives correctly designed and installed perform economically. Because a large proportion of belting drives have been made of inferior material, or have been incorrectly designed and installed and consequently have *not* performed economically, a distinct trend away from belting to positive types of drives has been witnessed of late years. More recently, better belting, sounder belting application, and wiser belt selling have together regained some of the lost ground.

Unfavorable Conditions

It is perhaps easier to note some of the conditions unfavorable to the use of belting drives than to attempt to list the many conditions under which belting may be used economically. The following remarks are not

conclusive, for exceptions may be taken. In general, however, conditions are not conducive to belting use.

1. *On portable equipment.* Machines which are in themselves movable, such as hoists, cranes, industrial trucks and portable power tools of all descriptions, are not ordinarily adapted to belt driving, primarily because of lack of space. Note, however, as an exception, the portable gas-engine driven air-compressor, where a resilient drive is needed to connect a pulsating power source with a pulsating machine load.

2. *On machines which require extremely large applications of power and are subject to extremely heavy shock loads.* A great deal of steel mill machinery falls into this classification, such as blooming mills, ingot

equipment operating at standard motor speeds. Here we may note such apparatus as centrifugal fans, blowers and pumps, rotary pumps, etc.

5. *On hoisting and elevating equipment.* Here cables take the place of belts as a special case of the belting drive, operating on similar friction principles, and the positive-acting gear eliminates slippage in power transmission.

6. *On certain special production machines.* Where a number of different operations are carried on simultaneously and in exact time with one another, as in a gear former, a positive type of drive is indicated. Likewise, as a special case here, there may be included many of the modern types of machine tools, using from two to twelve motors to drive various

conditions we may note the factors of load characteristics, speed, pulley, ratios, pulley centers, and position of drive (whether horizontal, inclined or vertical). Under physical conditions we may note the flexibility of the belt fabric (high speed drives with small pulleys require a great deal more belt flexibility than slow speed drives with large pulleys), the stretching qualities of the belt, the co-efficient of friction between the belt and the pulleys, the tension required to maintain a high coefficient of friction, and the wear-resisting qualities of the belt surface. Under chemical conditions we may note the resistance of the belt to dust, grit, steam, moisture, water, oil, dry heat, and acid or alkaline fumes or dust. These conditions may be met by a study of the engineering data available for the various types of belt-

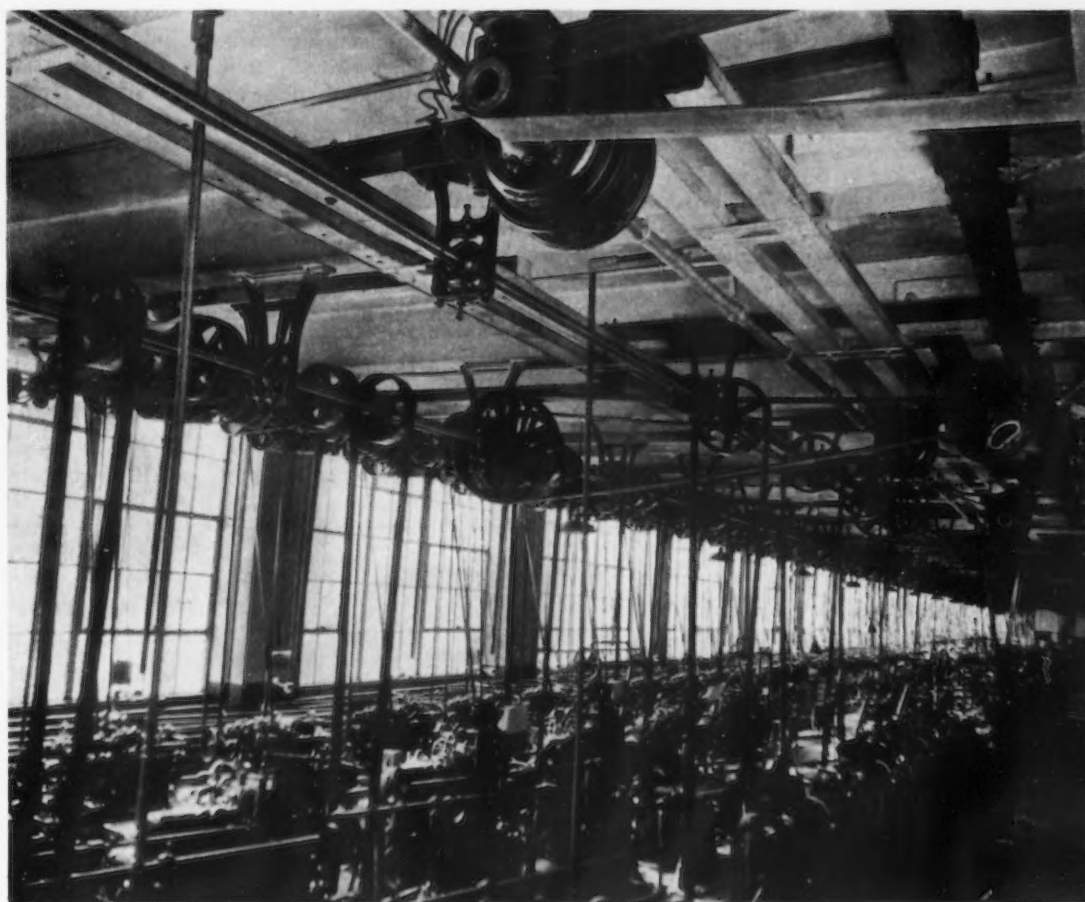
AT LEFT

TWO drive conditions handled differently. One Lincoln motor is V-belted to an air-compressor to protect the motor from the pulsating shock load; the other is direct-connected by flexible coupling to a smoothly running centrifugal pump.

o o o

AT RIGHT

THE use of the Modern Group Drive method in a large office equipment plant. Leather belts drive group-shafts, from which leather belts drive the automatic screw machines in batteries of eight to ten per group.



rolls, strip steel rolls, etc. In other industries note also, cement kilns, stone crushers, ore grinders, etc.

3. *On equipment requiring a large reduction in speed and where the load is fairly steady.* Industrial conveyors, wire-drawing machines, boring mills, turning mills, metal planers, industrial stokers, pipe-threaders and the like are better adapted to gear drives.

4. *On single, isolated pieces of*

parts simultaneously, but not necessarily in synchronism.

Conditions to be Weighed

The real test of the economic value of any belt drive is its actual use over a long period of time on the work for which it is designed, and under the mechanical, physical and chemical conditions to which it will ordinarily be subjected. Under mechanical con-

ing, and by the results of observations of belting in use under similar conditions. The problem here goes further than a mere consideration of belting characteristics alone; it must include a consideration of the type of pulleys used, and of the possible auxiliary equipment such as pivoted motor bases or other means of maintaining uniform tension in the belt automatically.

(CONTINUED ON PAGE 45)

... THIS WEEK ON THE

... Buying trends show mild improvement ... Light car field assumes greater importance with Willys building staff of experts ... Tool and die manufacturers await approval of new UAW contract.

DETROIT.—Slight changes in buying trends have taken place in the last 30 days—all of them in the right direction. A business analysis for April made by the Purchasing Agents' Association of Detroit indicates a little improvement. Seventy-one per cent of the reports show buying within a 30-day range, compared with 77 per cent the previous month.

The group existing on a hand-to-mouth basis has decreased from 59 per cent to 49 per cent, certainly a better sign. The fact that commodity prices are weak has a bearing on the attitude of Detroit buyers. However, the main reasons for so much short-term purchasing are the immense inventories still being held by many of the automotive plants and their parts suppliers.

The purchasing agents' survey also shows that only 3 per cent recorded greater inventories than 30 days ago, when 4 per cent showed increases. However, there is very little indication that inventories are dropping sharply; actually, only 59 per cent had smaller stocks, whereas in March 64 per cent reported that way.

Production Declining

Downward revision in its estimate of May production was made last week by Ward's Automotive Reports, which conceded possibility of only 190,000 assemblies in May, a full 50,000 less than earlier expectations. Without a doubt, manufacturers appear to have changed their plans during the past few days and are starting to taper output quite sharply. In fact, last week's production was only 47,415 passenger cars and trucks, against 53,385 the previous week, far below the 139,507 produced a year ago.

Ford and Chevrolet were on the same plane, producing 12,000 and 12,500, respectively, while Plymouth output was 5300. Unless retail sales

show some unusual improvement, it is predicted that production will continue down the slide.

Buick is still a surprisingly strong factor. It chalked up 18,150 units in domestic retail deliveries during April, compared with 15,435 in March, thus maintaining a strong fourth place in the industry with a gain of 17.6 per cent during the month, compared with a national April improvement of 5.87 per cent, estimated by R. L. Polk & Co. The same service earlier reported for March a 53.56 per cent gain in national registrations over February.

Plymouth's success with its new low-priced Roadking line is indicated by registration figures for March. According to these, Plymouth moved into first and second place for the first quarter of the year in 14 important cities throughout the country, largely



FLOYD KISHLINE becomes chief engineer of Willys-Overland Motors, Inc.

due to the influence of the new Roadking line and intensive advertising, according to Plymouth officials.

Willys Expanding Staff

Willys-Overland Motors, Inc., at Toledo has been building up a staff of outstanding experts to handle every angle of its automotive business. Last week Floyd Kishline, credited with the design of Graham Paige's super-charged engine, became chief engineer of the Willys organization. Kishline, for the last year head of the Detroit section of the Detroit Society of Automotive Engineers, was Graham's chief engineer, is a prominent figure in the technical fraternity and is acknowledged by other engineers as a valuable addition to the Willys staff.

Three months ago Delmar G. (Barney) Roos, an internationally known automotive engineer and former national president of the Society of Automotive Engineers, was named vice-president of the Willys company in charge of engineering. Mr. Roos, whose experience dates back to the Marmon Motor Car Co., was chief engineer of Studebaker for a decade.

Ford's ex-sales manager, William C. Cowling, already is active at Willys as vice-president and sales manager. He made a name for himself marketing the Dearborn product.

New Light Cars A Possibility

This company has paved a path that will undoubtedly be followed by others in the introduction of light weight, more modernistic looking cars, and brings to a head several rumors about such vehicles. More than a week ago, telegraphic news services reported that Emile E. C. Mathis, French motor manufacturer was in this country to follow up plans for the production of a rear engine motor car, powered with a radial type engine for the low-priced field. Later Mathis is said to have denied this report, asserting that he was interested only in experiments by the Mawen Motors Corp., Long Island City, which is testing light weight radial engines for aircraft use. Still later it was reported that Alex Wenner-Gren, Swedish industrialist, en route through the Panama Canal to Sweden on his yacht, had announced that he would place such an automo-

ASSEMBLY LINE

By W. F. SHERMAN
Detroit Editor

ble on the market for \$500 before the end of the present year.

Coincidental with the Mathis rumor, unsuccessful attempts were made in Detroit to confirm the report that Crosley Radio interests would shortly try to produce a low-priced car.

It is evident, however, that the Murray Corp. is doing development work on a new type automobile, possibly one with a four-cycle motor.

New Contract For Die Workers To Be Voted On

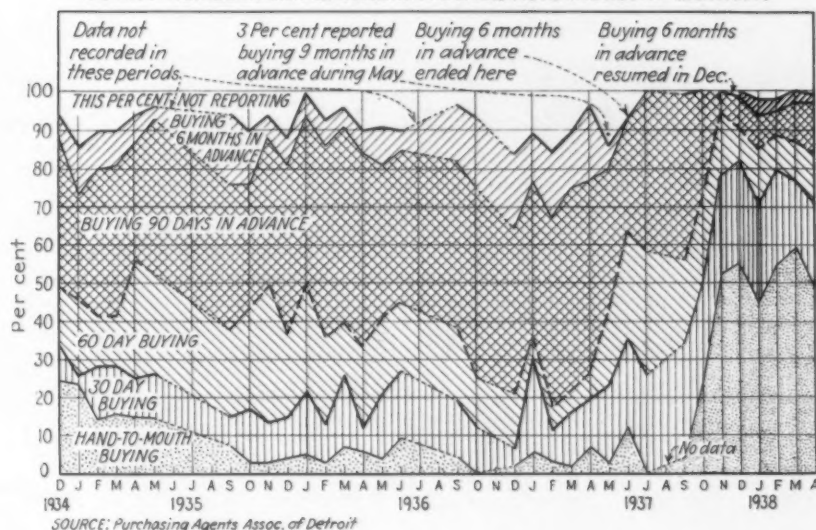
An important change in the relationship of the Detroit tool and die manufacturers and the UAW will be effected if the new contract, being voted on this week, wins approval. Months of negotiations have gone into formulating the proposals. The most important single provision is one which changes the expiration date from May 1—in the middle of the automotive tool and die program—to Jan. 1, 1940. Under terms of the agreement, negotiations will be opened 60 days before the expiration date, giving all of November and December to iron out difficulties before die work for new models is started. In addition to the 1940 date, provision is made for negotiations of any points that may arise within the next few months, and the period set for that is Nov. 1 of this year to Jan. 1, 1939. This change from May 1 provides an assurance against strikes that has been sadly lacking.

In addition, a minimum wage scale is continued which one spokesman of the industry said, "We should be able to live with unless business conditions become too bad."

A spread work policy is incorporated which provides for reduction of employment to 32 hr. a week when necessary, or an alternating 32 hr. plan that will provide employment for all the men.

A sizable volume of tool and die work has been flowing into Detroit shops in connection with the changes to be made for 1939 models. Employment is said to be steadily climbing and already close to the levels attained at this time last year, but of course the minor nature of the changes probably will reduce the length of the busy season.

BUYING TRENDS IN METAL-WORKING FIRMS AND AUTO INDUSTRY (DETROIT)



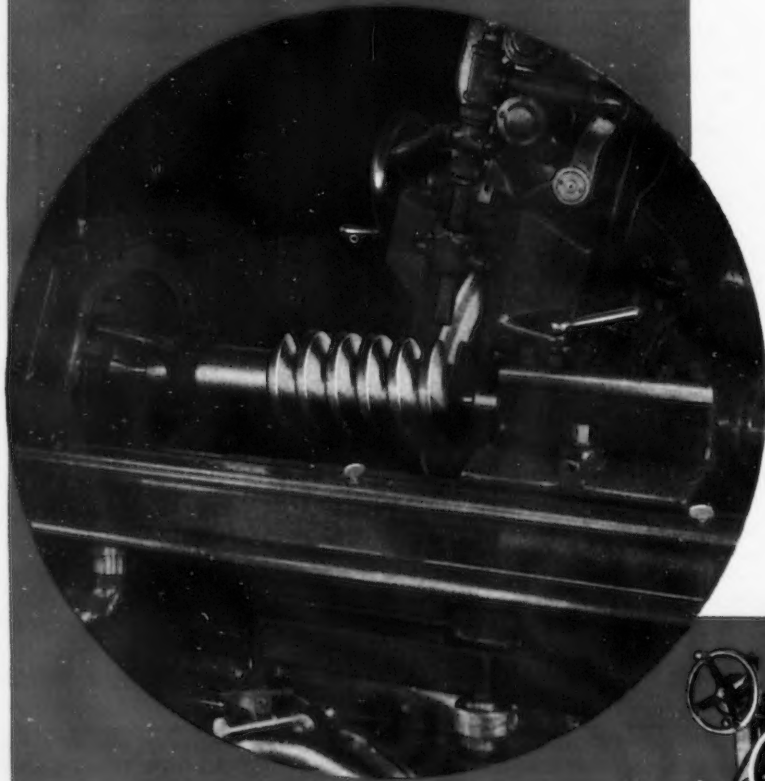
THE BULL OF THE WOODS

BY J. R. WILLIAMS



Bigger and Better Worms

"THERE IS NO BETTER PAYING INVESTMENT
THAN THE RIGHT TOOLS FOR THE JOB!"



That's what a large elevator manufacturing concern had to have, and their need was met by the latest Pratt & Whitney 6" x 36" Universal Worm Grinder.

What it is and what it will do is a long story, but if you need better big worms the story will be of interest to you.

For detailed information write to our nearest branch office.

• • •

PRATT & WHITNEY

DIVISION NILES-BEMENT-POND COMPANY
HARTFORD, CONNECTICUT

Branch Offices and Agencies: BIRMINGHAM BOSTON CHICAGO
CINCINNATI CLEVELAND DETROIT LOS ANGELES NEW YORK
PHILADELPHIA PITTSBURGH ROCHESTER SAN FRANCISCO ST. LOUIS



The Economic Problems of Belt Selection

(CONTINUED FROM PAGE 41)

But these are primarily engineering considerations, about which volumes of data have been written. Belting may be compared to the harness (and especially the traces) which enables a horse to pull a wagon (the load). "The best traces cannot rejuvenate a decrepit horse, ease ungreased axles, lighten a load twice as heavy as the wagon was meant to carry, or guarantee the good sense of the driver. They can do better than poor traces under any conditions, they can pull loads and resist frictional stresses which poor traces will break under, but no more. No one kind or type of belting will serve all purposes with equal satisfaction, or give a maximum return on unit cost no matter how or where employed. An intelligent selection of the proper belt will greatly help in obtaining maximum efficiency under adverse conditions, but the best results and the most uniform return of value require that the most suitable type of belt, of the right size and the right form of construction, shall be chosen, in accordance with the work to be done." (Standards of Practice, Boston Woven Hose & Rubber Co.)

It is essential that the conditions under which any power transmission device is to work should be adapted to the characteristics of that form of drive. A belt used to transmit power is merely a means of connection, and the finest connecting rod will not run a locomotive with flat wheels, leaky valves, and a lukewarm boiler. Regarded as a means of connection, a belt is merely an open, flexible wheel provided with millions of microscopic cogs on the inside meshing with millions of tiny points on the surfaces of the pulleys. A sudden overload throws these invisible cogs out of mesh, and the belt slips without engagement; whereas actual cog-wheels would remain in mesh, transmitting the shock in the case of a sudden overload, or the strain in the case of a continued one. Under a continued overload the belt alternately slips and holds, cushioning the strain. Correct mechanical principles require that a belt, for perfect performance, should not any more be subjected to overload than the gear, or series of gears, whose place it takes. Its added safety under overload

is insurance, not a normal factor of operation.

The best belt is the belt which provides the best connection between supplied power and applied power. Consequently the engineering considerations which enter into the design of a mechanically correct belting installation must be applied with the greatest of care. But—and this is a very big but indeed—it is perfectly possible to apply a belt to a given job in such a way as to secure, for the time being, perfect performance, and still violate sound economic principles.

The Economic Touchstone

The economic touchstone whereby the value of any drive may be ascertained, is the *cost of power transmitted during the effective life of the machine that is driven*. In this statement are concealed four factors of economic importance:

- 1—The initial cost of the drive as installed.
- 2—The ability of that drive to gain satisfactory performance from the driven machine.
- 3—The cost of maintaining that drive at the point of satisfactory driven machine performance indefinitely.
- 4—The effective life of the drive at that point of satisfactory driven machine performance.

Each of these factors are tied in to each other. Manifestly, initial cost, of and by itself alone, is meaningless. A drive which costs \$400 installed and gives satisfactory performance for two years, costs more than an \$800 drive lasting five years. Almost any drive which is properly proportioned will give satisfactory driven machine performance at the moment of installation. What the story may be some months or years later is something to think about seriously. The cost of maintenance varies tremendously on all types of drives. Poor belting, for instance, may stretch so much that periodical take-ups will be required, and belt tension may have to be held so tight that bearings run hot or burn out. And effective drive life at the point of satisfactory driven machine performance is intimately related to all the foregoing.

The real cost of a belt is, therefore,

its final cost. When to the initial cost of the installation there is added the cost of operation throughout its effective life, the cost of maintaining it in satisfactory operating condition throughout its life, the cost of power it has wasted through inefficient operation throughout its life, and the cost of production lost through inefficient operation or breakdown throughout its life, the real cost may be evaluated. (This is true, of course, of any and all types of drives, equally with belting drives.)

On this economic basis many thousands of well-designed and properly installed belting drives justify their continued existence today throughout industry, and prove the value against competition, of the *good belt*. Unfortunately, at least an equal number of poor belting drives (poor because of inferior materials or workmanship in so far as the belt itself is concerned, and because of bad engineering application in so far as the actual installation is concerned) are making users think of other types of drives rather than of the basic causes of their own distress.

Belt drives have a natural place in industry, as have all other forms of power transmission equipment. They are not universally applicable under the conditions of modern industry. Where conditions are conducive to their use, where the right type and size of belt for these conditions is specified and installed, where the auxiliary equipment indicated is chosen intelligently, and where the installation is made correctly and maintained with reasonable care, the economic value of the belt drive is extraordinarily high.

Link-Belt Book Tells Of "Twist Type" Chain

A NEW 174-page roller chain data book, just published by Link-Belt Co., Indianapolis, covers all applications and uses of the company's Silverlink roller chain, sprockets for drives and conveyor uses, and for the first time discusses a new patented chain known as "Twist-Type." This chain, provided with axial clearance to accommodate a normal amount of twisting action, is said to have a wide application to chain-driven trucks and road-grading equipment. The book contains notes, formulae and tabular data on selecting combinations of chain and wheels for efficient drives.

THIS WEEK IN WASHINGTON

... U. S. Supreme Court directs court in Philadelphia to "show cause" in Republic Steel case ... White House indicates it lacks remedy for "unwarranted price increases" ... Pump priming plans make progress.

By L. W. MOFFETT

Resident Washington Editor
The Iron Age

o o o

WASHINGTON.—Responding to a Government request, the Supreme Court on Monday called upon the Third Circuit Court at Philadelphia to show cause why it should not vacate its order against the Republic Steel Corp., making absolute a temporary order restraining the National Labor Relations Board from "taking any steps or proceedings" in the case. Speaking orally through Chief Justice Charles E. Hughes, the Supreme Court told the lower court to reply by next Monday when arguments will be heard.

The Chief Justice, who said the "show cause" order would be issued by the Supreme Court, spoke for the highest judicial tribunal after Solicitor General Robert H. Jackson had asked to file a formal petition to have the lower court's decree against NLRB vacated.

Board Faces Adverse Decisions

The board hurried to the Supreme Court a few hours after the court in Philadelphia last Friday issued its restraining order in the Republic case. The lower court had required the NLRB to certify its record in the Republic case "as is." The order was made absolute. Acting through Solicitor General Jackson and Charles Fahy, the board's counsel, the Government asked the Supreme Court for a writ of mandamus against the lower court. The board was particular-

ly anxious for the favorable Supreme Court action, which was forthcoming, for the board is faced with growing adverse lower court orders that have piled upon it one after another. Other legal contests are looming, one of which is the Inland Steel Co. case.

Filed with Chief Justice Hughes, the Government petition for a writ demanded that the Supreme Court require the lower court to show cause why the board should not be permitted to reopen the Republic case. The Circuit Court, through Judge Joseph B. Buffington, held that the board could not proceed further in the Republic case until the court received a complete record, as demanded by Republic, of the board's proceedings. It was on the basis of these proceedings that the NLRB on April 8 ordered Republic to reinstate 5000 SWOC strikers.

In its petition the Government maintained that under Section 10-D of the Wagner Act, the board could vacate an order before filing the record. Robert B. Watts, associate counsel for the NLRB, had unsuccessfully asked the Circuit Court for a stay of its order until the board could apply to the Supreme Court for "peremptory writs." He told the lower court that the NLRB intended to withdraw its order against Republic and reopen the case so that the record would meet with the requirements of the Supreme Court's ruling in the Kansas City stockyard case for a "full, fair and open hearing" by Federal administrative and quasi-judicial bodies before issuing an order.

More Adverse Rulings

The board's rush to the Supreme Court in the Republic case came on

the heels of another of a series of adverse court rulings. The Sixth Circuit Court at Covington, Ky., had just refused an enforcement order against the Sands Mfg. Co., of Cleveland. Speaking through Judge Florence E. Allen, the court declared that an employer cannot be accused of discrimination when he has made sincere efforts without success to produce agreement on a labor policy.

The court held that the board's findings against the Sands company, manufacturer of heaters and valves, were not substantiated by the evidence. The NLRB was warned that "with scrupulous impartiality" it must evaluate the evidence presented on behalf "not only of the employees but also of the employers."

Also, the court at Covington earlier had refused to permit the board to withdraw its ruling against the Ford Motor Co. Additional cases which already had reached the circuit courts but which the NLRB was considering reopening included those involving the Inland Steel, Douglas Aircraft and others.

Bill Would Enable U. S. To Store War Materials

WASHINGTON. — Senator Thomas, of Utah, chairman of the Senate Military Affairs subcommittee handling the scrap licensing bills and proposals to conserve domestic supplies of manganese, has introduced a bill in the Senate to authorize the Secretaries of War and Navy to procure and put into storage domestic supplies of "strategic" and "critical" materials which are deemed insufficient to meet the industrial, military, and naval needs of the country.

The War and Navy Departments acting jointly through the Munitions Board would determine what materials, concentrates and alloys are "strategic" and "critical" and would be authorized to spend \$25,000,000 each year for their purchase for the three-year period beginning June 30, 1939.

HOW YOU CAN GET

MORE PRODUCTION — BETTER FINISH AND LONGER WHEEL LIFE

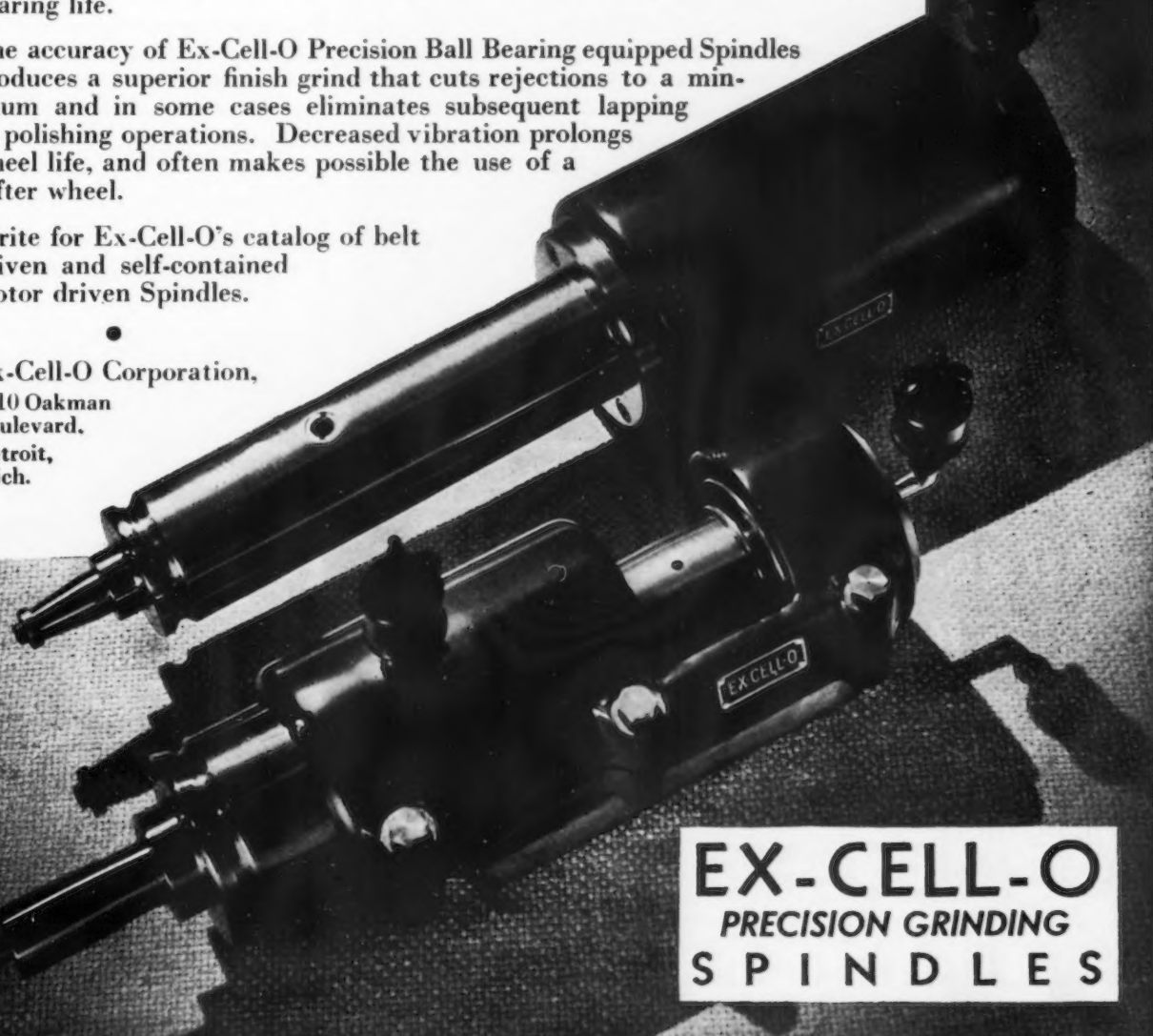
Grinder performance depends on the accuracy of grinding wheel spindle bearings, which must have minimum end and radial play, must not generate excessive heat, and must stand the gaff for months without adjustment or replacement.

To incorporate all these features, Ex-Cell-O designed a special Precision Bearing with balls selected to exact size and roundness, for its Spindles. These balls make a three-point contact with the races, giving them a spinning motion and presenting the whole surface of each ball for wear. Between the balls and the races a perfect but very narrow contact is "developed" or run in, permitting sustained high speed without overheating and prolonging bearing life.

The accuracy of Ex-Cell-O Precision Ball Bearing equipped Spindles produces a superior finish grind that cuts rejections to a minimum and in some cases eliminates subsequent lapping or polishing operations. Decreased vibration prolongs wheel life, and often makes possible the use of a softer wheel.

Write for Ex-Cell-O's catalog of belt driven and self-contained motor driven Spindles.

Ex-Cell-O Corporation,
1210 Oakman
Boulevard,
Detroit,
Mich.



EX-CELL-O
PRECISION GRINDING
SPINDLES

EX-CELL-O

DRILL JIG BUSHINGS. GRINDING SPINDLES. HYDRAULIC POWER UNITS. PRECISION BORING AND FACING MACHINES. PRECISION THREAD GRINDERS. COUNTERBORES. BROACHES. CARBIDE TOOL GRINDERS. CARBOLOY TIPPED TOOLS. SPECIAL HIGH PRODUCTION MACHINES. GROUND FORM TOOLS. PRECISION PARTS. MILLING CUTTERS

EX-CELL-O CORPORATION, 1210 Oakman Blvd., Detroit, Mich.

Please send me, without obligation, your latest catalog on Grinding Spindles (Also, on the products I have checked at the left).

Name..... Title.....

Company.....

Address.....

Roosevelt Admits He Lacks Remedy For Price Increases and Inventories

WASHINGTON. — Whatever plans the Administration had for dealing with what the President has described as two prime causes of the current depression—unwarranted price increases and unabsorbed inventories — they have been

abandoned for the present, it was indicated at the White House last week.

Mr. Roosevelt told a press conference that unfortunately he lacked any immediate remedy for coping with these two causes and recalled that his Administration had been working in

that direction in an experimental way under NRA but that that effort had been blocked by the Supreme Court. As a result, he explained, the whole thing will have to be started anew, although he warned against interpreting his remarks as advocating a new NRA set-up.

Instead, the Administration hopes to find some solution to the problem through the monopoly study which the President recommended be authorized by Congress at this session. Mr. Roosevelt reiterated his hope last Friday that Congress will take action on the monopoly suggestions before it adjourns.

Price Policies Seen Changing

In his anti-monopoly message on April 29, the President referred specifically to steel and cement, struck out at identical bidding, and raised the point that proof of identical bids, uniform price increases, price leadership or other indications of price rigidities might be accepted as prima facie evidence of unlawful actions. This was but one phase of the sweeping revision of the anti-trust laws urged by the President.

For several weeks past there have been indications the Administration was withdrawing from its former position of forcing down prices on commodities which have been described as "out of line" with general price levels, and the President's statement on Friday was taken to mean that the matter will not be pressed further at least for the time being.

The ostensible reason, as drawn from his press conference, is that the Administration now considers it a long-range problem as indicated by the plan to tie the problem in with the anti-monopoly study. But deeper than that was the difficulty, foreseen for weeks, of attempting to pull down prices considered out of balance at a time when the Administration itself is sponsoring a second recovery drive, definitely inflationary in character.

Pump-priming Progresses

Meanwhile, the New Deal's pump-priming efforts moved forward apace last week with the House giving its approval to the President's relief-recovery bill. It sent the measure to the Senate in substantially the form requested by Mr. Roosevelt. The bill carried \$965,000,000 of direct appropriations for PWA, and also empowered the agency to lend up to \$500,000,000 of its revolving fund; assured Harry Hopkins' WPA of \$1,250,000,000 for direct relief until Feb.

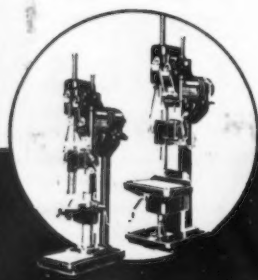
CINCINNATI BICKFORD



Production drilling at the Niagara Machine & Tool Works, Buffalo, N. Y., on 2-21" and 1-28" Super-Service Uprights. (Cincinnati Bickford Radial Drills in the background.)

All geared 21" 24" and 28" SUPER SERVICE UPRIGHTS

Make YOUR production drilling more profitable



Niagara Machine & Tool Works is but one of many progressive plants getting "more holes per dollar" with Super-Service Uprights—modern, accurate machines developed from 63 years of specialized experience.

Among the features contributing to long life are: Automatic oiling, anti-friction bearings, heat-treated alloy steel parts, and complete enclosure. Profitable, fast, easier production is assured by convenient controls, automatic depth gauge and direct reading speed and feed plates.

Get all the details. Let us prove that you, too, can make your drilling operations more profitable.

The Cincinnati Bickford Tool Co.
Oakley, Cincinnati, Ohio

1, 1939; and authorized REA to spend \$100,000,000 in furthering its rural electrification program. The latter authorization had not been recommended by the President.

Overriding Republicans, whose theme song was that the bill was not for economic recovery but for "political rehabilitation," Administration lieutenants reaped 308 votes for passage as against the 89 votes cast by the opposition.

House Approves Tax Bill

The conference report on the 1938 revenue bill, eliminating the capital gains tax provision and modifying the undistributed profits tax, was also approved by the House on Wednesday and was sent to the White House for approval. Earlier in the week the Senate approved the report in less than five minutes.

The measure, designed to raise \$5,300,000,000 in taxes, marked an end to the tax controversy which has been raging in Congress for seven months because of concerted opposition from business interests to the undistributed profits and capital gains taxes. The bill represents a compromise between the Senate and House drafts, although it is generally recognized as being far more liberal than the existing law.

It was characterized by Senator Harrison, chairman of the Senate Finance Committee, and Representative Doughton, chairman of the House Ways and Means Committee, as a "business recovery and tax relief bill." Harrison originally recommended elimination of the undistributed profits tax provision but White House pressure forced the conferees to retain the tax in principle.

Railroads Seek Delay In West Coast Increase

WASHINGTON. — Railroads have filed an application with the Interstate Commerce Commission for permission to postpone until June 20 advances on iron and steel products to Pacific Coast ports. By that time it is expected that the Atlantic intercoastal lines will publish their increases which will place the rates from eastern territory to the Pacific Coast ports on the same level as rates published from CFA territory to become effective May 20. The increases on iron and steel products to Pacific Coast ports were authorized in connection with the recent general rate advance decision.

NLRB Orders Election— For Waterbury Brass

WASHINGTON. — The NLRB, at the request of the CIO's brass workers union, has placed the union's name on the ballots to be cast by employees at the May election at the Waterbury Brass Co., Waterbury, Conn. Workers will vote for either the CIO union, the Metal Workers Association, of Waterbury, or for neither, the board announced.

U. S. Makes Cement Award f.o.b. Mill

WASHINGTON. — The Procurement Division of the Treasury Department made its first award for cement on an f.o.b. mill basis last Friday to the Monolith Portland Cement Co., at \$1.63 per barrel, Monolith, Cal., less 10c. per barrel if paid in 30 days. The entire lot of 250,000 bbl. asked for the California delivery went to this company, the lowest bidder. There were seven bidders.

COOL
Because it's Ventilated
COOL

in operation resulting
in longer life
and uniform power.



- Greater Magnetic Pull
- Deeper Magnetic Field
- Water-Proof Construction

resulting in better concentration, purification, and protection.

Pioneers in the development of Magnetic Pulleys, STEARNS engineers worked long and carefully in perfecting this improved, ventilated, better engineered pulley. Years of experience are back of this modern pulley—years of observation of pulley performance in the field. Its design ends many service problems . . . its ability means new savings . . . its benefits are numerous. It is your answer for a better Magnetic Pulley.

Use the coupon—get complete details.

Investigate this better performance for yourself. We shall be glad to give you full details about this ventilated, cool performing pulley upon receipt of coupon.

Stearns Magnetic Manufacturing Co.
635 So. 28th Street, Milwaukee, Wis.

Please send Bulletin 301 regarding the new Stearns Magnetic Pulley

Name
Company
Street
City

ONE FENDER LIFTS 3000 LB. SEDAN

Speed Nut



that the SPEED NUT system of assembly is both better and faster and costs less.

OVER
250
DIFFERENT
DESIGNS

The incredible strength of Tinnerman SPEED NUTS is graphically shown in this lifting test. An automobile weighing 3025 lbs. was completely lifted off the floor with a single fender SPEED NUT of spring steel weighing less than 1/4 ounce. But unusual strength is only part of the story. Important to you is the fact

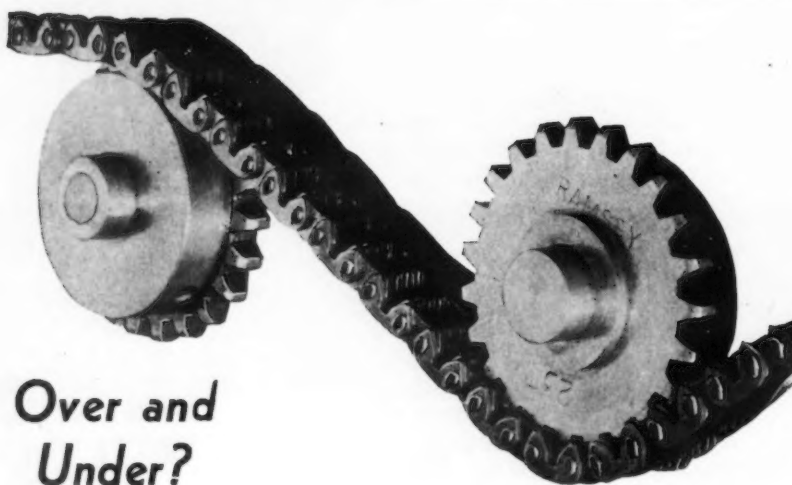
it. Over 500,000,000 already used. Over 250 different shapes and sizes already adopted. Let our development engineering department show you how the SPEED NUT system of assembly can help you now.

That means a wider profit margin to work on and yet improving the finished product rather than cheapening

SPEED NUT DIVISION

TINNERMAN STOVE & RANGE CO.
2040 Fulton Road, Cleveland, Ohio

Manufacturers of Patented SPEED NUTS



**Over and
Under?**

Drive it with Silent Chain

No longer is it necessary to tolerate slipping belts for drives where shafts are required to turn in opposite directions.

Silent chain, the only drive medium possessing qualities of endurance at high speeds, is now constructed to drive from both its surfaces. Complicated mechanisms can be 100% positive without using idlers. Compact, long life, no lost motion.

Send for folder D-338 describing Ramsey Duplex Silent Chain. It's free.

RAMSEY CHAIN CO., Inc., 1050 Broadway, ALBANY, N. Y.

RAMSEY SILENT CHAIN DRIVES

Machine Tool Orders Declined in April

MACHINE tool orders declined in April after rising in March above the February rate. The April index figure of the National Machine Tool Builders' Association was 90.3 compared with 107 in March and 75.7 in February. The 1937 peak was 282.5 in January. The three-months' moving average has also declined to 91 for April against 100.4 in March and a high of 234.2 in February, 1937.

Foreign orders were 51 per cent of the total in April compared with 52 per cent in March and a high of 63 per cent in December, 1937, and January, 1938.

The volume of domestic business has held fairly steady within a narrow range for the year to date. Foreign demand has been less steady.

Bethlehem Steel Enters Seamless Tubing Business

BETHLEHEM STEEL CO. announces that it has entered the seamless tubing business and is now ready to supply seamless casing, tubing and line pipe, thus rounding out its line of oil industry products.

All standard sizes and types of seamless casing, tubing and line pipe up to and including 8 5/8 in. outside diameter are available. A mill depot has been opened in Houston, Tex., at 7200 Clinton Drive, where a complete stock of seamless products will be maintained. Adequate stock is also maintained at the mill at Beaver Falls, Pa.

The company will continue manufacture of lapwelded surface casing, from 10 3/4 in. to 13 3/8 in. outside diameter, as well as all sizes of lapwelded line pipe up to and including 16 in. outside diameter. These products will also be stocked at the Houston depot.

Harvester's U. S. Sales Decline 13%

CHICAGO — International Harvester Co.'s domestic sales dropped 13 per cent for the six months ended May 1, Sydney G. McAllister, president, reports. Foreign sales, however, are holding up and may show a slight increase this year. Work hours are 30 per cent under the 1937 peak, and a four-day week is now generally in effect throughout the company.

40th Metal Trades Convention May 25

NATIONAL METAL TRADES ASSOCIATION, holding its 40th annual convention at New York, May 25-26 at the Hotel Biltmore, plans a program which includes these speakers:

W. E. Odom, William Odom Associates, Chicago, "More Stable Employment and Economy"; Frederic Snyder, Kingston, N. Y., "Keeping Ahead of the Headlines"; Harold F. Broome, National Industrial Conference Board, New York, "An Appraisal of Factors in the Labor Relations Situation"; C. S. Craigmile, vice-president, Belden Mfg. Co., Chicago, "Employee Meetings with Management"; C. C. Winegardner, vice-president, Diamond Chain & Mfg. Co., Indianapolis, "How We Handle Our Employees."

David R. Clarke, Fyffe and Clarke, Chicago, "Legal Aspects of Labor Relations"; T. J. Morton, Jr., president, Hoosier Lamp & Stamping Corp., Evansville, Ind., "A Community Program"; Allen W. Rucker, president, Eddy-Rucker Nickels Co., Cambridge, Mass., "Restoring the Control of Wages and Working Hours to Management"; O. D. Reich, vice-president, Dexter Folder Co., Pearl River, N. Y., "Job Evaluation" (report of NMTA committee); Col. W. T. Chevallier, vice-president, McGraw-Hill Publishing Co., New York, "Metal Age or Paper Age"; Representative Clare E. Hoffman, Michigan, "What the CIO Has Done to Michigan"; P. C. Jones, president, S. M. Jones Co., Toledo, Ohio, "What Is Wrong with American Business Men"; C. Wayland Brooks, attorney, Chicago, "America Wants to Know."

Sen. Josiah W. Bailey, North Carolina, will speak May 26 at the Association's annual dinner. Homer D. Sayre is the association's commissioner, Harry S. Flynn is secretary.

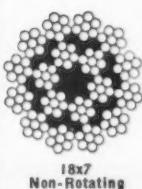
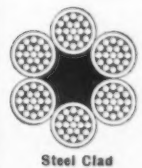
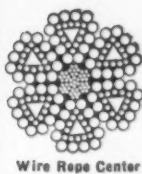
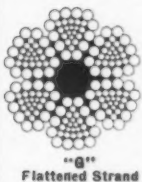
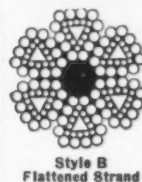
Stanley Engineer Ends His "First" 50 Years

DANIEL A. KEATING, who once momentarily resigned from the Bridgeport (Conn.) plant of the Stanley Works because he was threatened with loss of a half hour's pay for being three minutes late to work, this week concluded his first 50 years with the Stanley company. He is now chief engineer and works manager.

During ceremonies honoring Mr. Keating, it was revealed that he had designed (1) the first steel clock bell, (2) the first sparklet shell for carbonated gases, (3) the first steel seamless door knobs, (4) the first steel trimmings for stoves, (5) the first steel ball bearings for bicycles, (6) the first clincher rims made in America and had invented special types of baby carriage wheels, paper towel cabinets, billiard table tubes, window slides for cabs, etc.

M.D. Hubbard Spring Company
P. M. HUBBARD
J. A. HUBBARD, Secy.
CENTRAL AVE., PONTIAC, MICH.

**SPRINGS
STAMPINGS
WIRE SHAPES
EXPANSION PLUGS
WASHERS
COTTERS**



You Can Depend On

"HERCULES"* (Red-Strand) Wire Rope...

There is no guesswork when you use "HERCULES" (Red-Strand) Wire Rope. It is designed and built to do specific jobs better . . . safer . . . more economically. Furnished in a wide variety of constructions so as to be suitable for all purposes—each backed by 81 years of manufacturing experience and close co-operation with users.

—PREFORMED—

For maximum efficiency in Preformed Wire Rope, use Preformed "HERCULES". It is available in both Round Strand and Flattened Strand constructions.

Made Only By

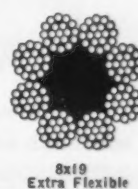
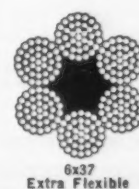
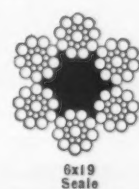
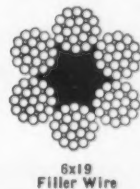
A. LESCHEN & SONS ROPE CO.

Established 1857

5909 KENNERLY AVENUE, ST. LOUIS, MO.

New York . . . 90 West Street
Chicago . . . 810 W. Washington Blvd.
Denver . . . 1554 Wazee Street
Reg. U. S. Pat. Off.

San Francisco . . . 520 Fourth Street
Portland . . . 914 N. W. 14th Avenue
Seattle . . . 2244 First Avenue South



...OBITUARY...

FORREST E. CARDULLO, since 1919 chief engineer of the G. A. Gray Co., Cincinnati, died after a long illness at his home in that city on May 7, aged 59 years. He was graduated from Cornell University in 1901 and from that time until 1905 was engaged in commercial work in the design of heavy gas engines and steam pumping engines. For the following three years

he was instructor and assistant professor of mechanical engineering subjects at Syracuse University and from 1908 to 1914, professor of mechanical engineering at New Hampshire State College. The following year he became chief draftsman of the Pierce-Arrow Motor Car Co., from which he resigned to become engineer of tests with the Curtiss Aeroplane & Motor Corp. Mr. Cardullo became chief engineer of the Gray company in 1919. He was the inventor of many new

improvements in the machine tool field; one of the most noteworthy being a system of helical involute gearing for metal planers. He was a member of the American Society of Mechanical Engineers and at the time of his death was junior past-chairman of the local chapter.

♦ ♦ ♦

ARTHUR P. BRONSON, retired assistant manager of sales, Milwaukee district, Carnegie-Illinois Steel Corp., died in Milwaukee on May 13, aged 71 years. Mr. Bronson at one time was assistant manager of sales, Chicago district, Carnegie-Illinois, and from 1905 to 1936 was connected with the American Sheet & Tin Plate Co.

♦ ♦ ♦

EDGAR W. WAGENSEIL, aged 54, general sales manager of Hagan Corp., died May 10 at Oakmont, Pa. He had been with the Hagan Corp. for the past six years and was a member of the American Society of Mechanical Engineers and the Engineers' Society of Western Pennsylvania. Mr. Wagenseil was associated successively with the Illinois Steel Co., Chicago Smoke Abatement Commission, Burke Furnace Co., Harrington Stoker Co., the Westinghouse company and Blaw-Knox Co., before becoming general sales manager of the Hagan Corp.

♦ ♦ ♦

ERNEST M. SPRAGUE, fabricating contracting manager at Cleveland for Bethlehem Steel Corp., died suddenly from a heart attack May 8 at his home. He was 72. Born in Farmington, Mich., Mr. Sprague was graduated from the University of Michigan as an engineer and entered the steel business with Gillette-Herzog Co., Milwaukee. Later he was placed in the Denver office of American Bridge Co. and went to Cleveland about 1905 for the same company. In 1917 he joined Bethlehem at Cleveland. For four years, until 1934, he was president of the East Cleveland, Ohio, City Commission.

♦ ♦ ♦

BERNARD H. GARHART, president, B. H. Garhart Foundry Co., Kansas City, Kansas, died May 5, aged 44 years. He was formerly associated with the Petroleum Iron Works in Sharon, Pa.

♦ ♦ ♦

CHARLES E. LOZIER, pioneer Cleveland automobile manufacturer, died May 9 in Fort Lauderdale, Fla., aged

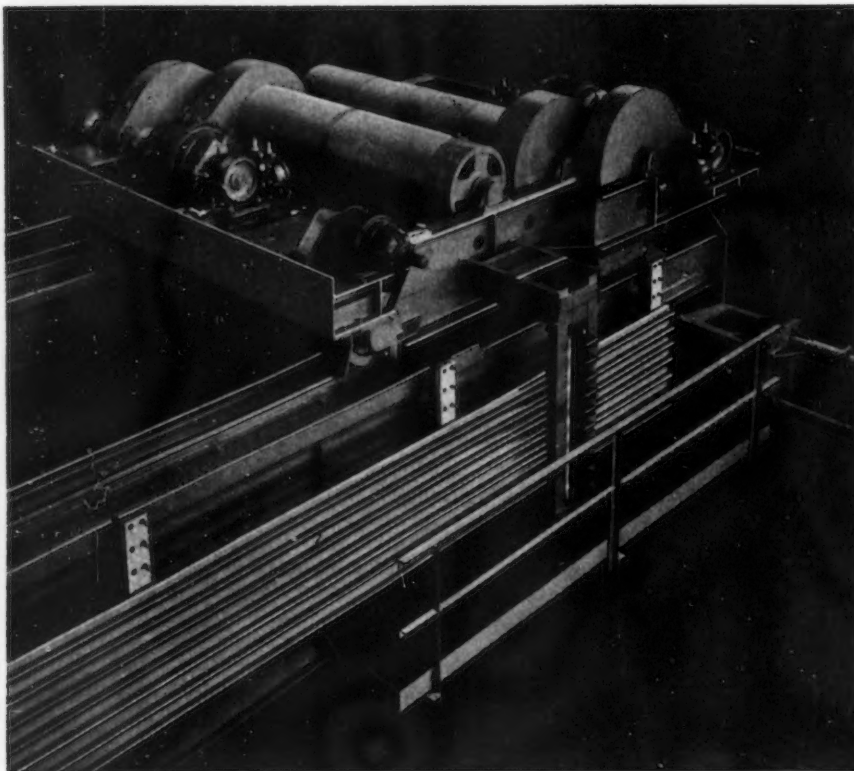
CLEVELAND



CRANES

All Welded for

Every Industry



● Shop view of part of a 60 ton, 4 motor, 86 foot span Crane having a 20 ton auxiliary. All welded, full roller bearing—(custom built to meet rigid requirements).

ALSO BUILDERS OF



THE CLEVELAND CRANE & ENGINEERING CO

1115 Depot St.

Wickliffe, Ohio

NEW YORK • DETROIT

PITTSBURGH • CHICAGO

MATERIALS HANDLING EQUIPMENT

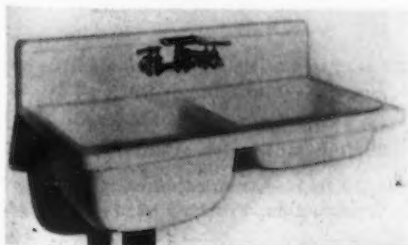
79 years. With a cousin he started out manufacturing bicycles and helped bring about the erection of a steel tube mill at Shelby, Ohio, so that tubing would not have to be imported from Birmingham, England.

❖ ❖ ❖

WILLIAM M. PURVES, prominent for more than a quarter of a century in the automobile industry, died May 8 in his sleep on a train bound for Los Angeles. It was his fiftieth birthday. Mr. Purves, born in Pittsburgh, spent many of his early years in Princeton, N. J., where he attended Princeton University. Subsequently he took an engineering course at Cornell. His first connection with motor cars was in Orillia, Ont., where he was a mechanic and service manager in the Canadian E. M. F. plant. He joined the Ford Motor Co. in 1913 and continued in various capacities until the World War when he became one of an executive committee of five, operating the gas defense plants in New York. At the close of the War, Purves rejoined the Ford organization, remaining with it until 1919, when he became assistant sales manager of the Wills-Ste. Claire Co. at Marysville, Mich. For a time he was connected with the Gray Motor Co., then became a member of the Dodge Bros. field organization as a district sales manager. A few weeks ago, on April 28, he was named general sales manager for the Dodge division of the Chrysler Corp.

A Difficult Drawing Operation

WHAT is regarded as one of the most difficult drawing operations in successful production today is in the manufacture of the new combination sink and laundry tray here illustrated, recently added to the Briggs Beautyware line of plumbing fixtures.



Giant auto-body presses at the Briggs Mfg. Co., are producing this fixture, which is made of a single, heavy sheet of Armco ingot iron, with no welds, and is 42 in. long, with a sink basin 7 7/8-in. deep and a laundry tray 12-in. deep. Eighteen operations are required to complete it. The largest dies employed weigh 20 tons, and die cost is said to be in the neighborhood of \$100,000. The presses employed are 60-ft. high and are capable of exerting pressures up to 1500 tons.

Tool Engineers' Society Moves Detroit Office

DETROIT.—A change in office location has been announced by Ford Lamb, the American Society of Tool Engineers' executive secretary. The national headquarters office staff moved the first of the month from 5928 Second Boulevard, Detroit, to Room 428, Boulevard Temple Buildings, 2567 West Grand Boulevard, Detroit.



**We take
our own
MEDICINE**

Used intelligently, advertising is an investment—not a speculation. This advertisement will be seen by a few important manufacturers who could benefit from our service. That's why we take our own medicine by advertising in THE IRON AGE. Succeeding advertisements in this space will tell what we offer.

**Advertising
as an Investment**

WM. B. REMINGTON, INC.
SPRINGFIELD, MASS.

THE NEWS IN BRIEF.

A business analysis by the Purchasing Agents' Association of Detroit indicates a little improvement in buying trends.
—Page 42

Light car field assumes greater importance with Willys building staff of experts.
—Page 42

Tool and die manufacturers await approval of new UAW contract.
—Page 43

U. S. Supreme Court directs court in Philadelphia to "show cause" in Republic Steel case.
—Page 46

Pump priming plans make progress.
—Page 46

White House indicates it lacks remedy for "unwarranted price increases."
—Page 48

Railroads seek delay in West Coast increase.
—Page 49

NLRB orders election for Waterbury Brass Co.
—Page 49

U. S. makes cement award f.o.b. mill.
—Page 49

Machine tool orders decline in April after rising in March.
—Page 50

Bethlehem Steel Co. enters seamless tubing business.
—Page 50

Harvester's U. S. sales decline 13 per cent for the six months ended May 1.
—Page 50

National Metal Trades Association holding its 40th annual at New York May 25-26.
—Page 51

Standley engineer ends his "first" 50 years in the company service.
—Page 51

A difficult drawing operation in successful production today.
—Page 53

American Society of Tool Engineers moves its Detroit office.
—Page 53

Supply Manufacturers and Dealers hold well-attended convention at Pittsburgh.
—Page 55

Inland Steel Co., Chicago, announces new open-hearth steel.
—Page 56

Lewis union signs "craft" agreement with railroad.
—Page 57

Machine Tool Dealers to meet at Dearborn May 23-24.
—Page 57

Third Machine Tool Electrification Forum held at East Pittsburgh.
—Page 58

Rockford holds tool, machinery display
—Page 60

Northwestern Barb Wire Co. changes its name to Northwestern Steel & Wire Co.
—Page 60

Heavy steels more active in first quarter of 1938 than in comparable depressed period of 1934.
—Page 61

1937 light steel output established new record.
—Page 74

U. S. Steel to spend \$80,000,000 this year.
—Page 74

Supreme Court again supports Labor Board.
—Page 78

RFC railroad bill modified; no strings on maintenance loan.
—Page 78

Exide celebrates 50th anniversary.
—Page 86

Inland group claims NLRB helps aliens.
—Page 86

Machine tool sales are dragging in most centers.
—Page 86

Firms with Government contracts are buying equipment.
—Page 86

SECTIONS INDEX

Obituary	52
Personals	62
Fabricated Steel	85
Steel Ingot Production	67
Summary of the Week	68
Comparison of Prices	69
Pittsburgh Market	70
Chicago Market	71
Cleveland Market	73
New York Market	76
Philadelphia Market	75
Scrap Market and Prices	78
Finished Iron & Steel	80-81
Pig Iron & Raw Material Prices	82
Warehouse Steel Prices	83-84
Non-ferrous Market	77
Machine Tool Activity	86
Plant Expansion & Equipment	88

CONVENTIONS

May 23—National Association of Purchasing Agents, St. Louis.
May 23 to 24—Associated Machine Tool Dealers, Dearborn, Mich.
May 25 to 26—National Metal Trades Association, New York.
May 26—American Iron and Steel Institute, New York.
June 12 to 17—Society of Automotive Engineers, White Sulphur Springs, W. Va.
June 27 to July 1—American Society for Testing Materials, Atlantic City, N. J.
Oct. 10 to 14—American Institute of Steel Construction, French Lick Springs, Ind.

Supply Manufacturers and Dealers Hold Well-Attended Convention

DISTRIBUTER - MANUFACTURER relations, sales training, practical analysis of the Wagner Act, price maintenance and trends in Federal legislation taxes, were a few of the important distribution and manufacturing problems discussed at the triple convention of the Southern Supply and Machinery Distributors Association, Inc., National Supply & Machinery Distributors Association and the American Supply and Machinery Manufacturers Association held at Pittsburgh last week and attended by well over 1200 members and guests.

High-lighting the manufacturers' meeting was a well received talk on the value of trade paper advertising by William E. McFee, director of copy and plans, American Rolling Mill Co. In covering the "why" of magazine advertising, Mr. McFee said that one of the most important reasons is to educate, persuade and move to favorable action the members of an editor's audience. This goes back to the study and evaluation of markets, and magazine advertising cannot be successful unless it is sensitively in tune with the advertisers' marketing strategy, he said.

As to "when" to advertise, the speaker said there is only one answer to this and that is all the time, admitting that the product is right, the markets are ripe and distribution adequate to the needs of the hour.

In covering "how" to advertise, the speaker said to find out what prospective buyers want to know about your product and keep putting that information into your advertisements. He cautioned manufacturers to be

to move downward from that point. The normal needs of the country are not being really satisfied at the present rate of production, and business is rapidly approaching the point at which whatever benefits may accrue from a prudent reduction of inventories, will have been realized. For the moment we do not feel constrained to adopt a decided attitude of either optimism or pessimism, nor to indulge in prophecy for the short range, but simply to signify an abiding personal faith in the ability of men to work together effectively for better things."

The average worker wants reasonable compensation and wants to meet management without embarrassment. J. H. Goss, vice-president, Scovill Mfg. Co., Waterbury, Conn., said. The personal touch is one of the important things in employee relations and the human factor exemplified by good-natured "razzing" in the mills and shops among employees is the same fundamental which employees bring in to meetings with management, the speaker said. Those executives who "can take it" will get along much better in their employee relations, and a cool head will show the employees that the boss is no different than they are. According to the speaker, many manufacturers know too little about handling labor and need to know the philosophy of the human problem, they need to study human emotions and they



W. A. PURTELL, president of Holo-Krome Screw Corp., Hartford, Conn., elected president of American Supply and Machinery Manufacturers Association.



T. RYAN of Cutter-Wood & Sanderson Co., Cambridge, Mass., new president of National Supply and Machinery Distributors Association.

sincere, interesting, informative, considerate of readers' time as well as his interest, persuasive and convincing.

B. F. Fairless Says Normal Needs Not Being Satisfied

At a joint luncheon of the associations, in presenting an address prepared by B. F. Fairless, president, U. S. Steel Corp., John L. Perry, president of Carnegie-Illinois Steel Corp., said "With respect to a basic industry which is operating at an average rate of approximately one-third of its capacity, this much may be said—there is vastly more room to move upward from 33 per cent than there is



JACK B. DALE of Briggs-Weaver Machinery Co., Dallas, Tex., elected president of Southern Supply and Machinery Distributors Association.

WIRE

**THAT CARBURIZES
FASTER . . . DEEPER**

The chromium in *KONIK forms carbides which increase the speed and amount of carbon absorption . . . you can get a deeper case, or a specified case in less time or with lower temperature. Hardening, too, is deeper, more uniform, more dependable. For a better product at lower cost use this modern metal with patented ratios of copper, nickel, and chromium.

CONTINENTAL STEEL CORP.

General Offices: Kokomo, Indiana
Plants at Canton, Kokomo, Indianapolis



**KONIK
STEEL**

CONTAINING COPPER, NICKEL AND CHROMIUM

REFD. UNDER U. S. PATENT NUMBER 1874554

CONTINENTAL

STEEL SHEETS AND WIRE PRODUCTS

Wire: Bright Basic, Annealed, *Konik, Special Manufacturers, Galvanized, *Flame-Sealed
Wire Rods, Nails, Staples, Bale Ties, Barbed Wire, Fence—15 Types; Gates and Fittings
Sheets: Black, Galvanized, Special Coated, Roofing and Siding—14 Styles

*Trade Mark Registered, U. S. Patent Office

**CUT YOUR HANDLING COSTS
WITH TOWMOTOR**

STRAIGHT GAS POWERED HYDRAULIC LIFT TRUCKS



Do you know why Towmotor lift trucks move more tons per hour? Do you know why Towmotors eliminate false motions and unnecessary maneuvering? Do you know why Towmotors spot their loads more precisely where you want them? Do you know

how easy it is to convert a Towmotor from coil handling to flat sheet handling, or anything else? Do you know that Towmotors have a lower fuel consumption per hour? These and many other questions are answered in bulletins and specification sheets waiting for your request to go in the mail.

TOWMOTOR COMPANY, 1231 E. 152nd St., Cleveland, Ohio
New York Office: 96 Liberty Street—Phone Barclay 7-3090

need to pick the right man for the job which involves contact with employees.

Officers Elected

New officers elected last week, are:

American Supply and Machinery Manufacturers Association: President, W. A. Purtell, Holo-Krome Screw Corp., Hartford, Conn.; first vice-president, D. W. Northup, Henry G. Thompson & Son Co., New Haven, Conn.; second vice-president, H. K. Clark, Norton Co., Worcester, Mass.; treasurer, Horace Armstrong, Armstrong Brothers Tool Co., Chicago.

National Supply and Machinery Distributors Association: President, W. T. Ryan, Cutter-Wood & Sanderson Co., Cambridge, Mass.; first vice-president, C. E. Curtis, Western Iron Stores Co., Milwaukee; second vice-president, A. R. Smith, Boyer Campbell Co., Detroit.

Southern Supply and Machinery Distributors Association: President, Jack B. Dale, Briggs-Weaver Machinery Co., Dallas, Tex.; first vice-president, Edward F. Stauss, Oliver H. Van Horn Co., Inc., New Orleans; second vice-president, J. M. Bates, Moore-Handley Hardware Co., Birmingham, Ala.

Inland Announces New Open-hearth Steel

A NEW open-hearth steel for which 20 per cent greater machinability is claimed will soon be introduced on a commercial basis, Inland Steel Co., Chicago, announces. Inland engineers have cooperated with the Battelle Memorial Institute in developing the new product which is said to combine the machinability of Bessemer steel with superior physical properties of open-hearth steel.

The new steel has been supplied for several months to a few cold bar producers who have cold finished it for a limited group of customers for testing.

TRADE NOTES.

The Marley Co., Kansas City, Kan., water cooling equipment manufacturer, has opened a southeastern sales branch at Atlanta, Ga., in charge of T. A. Tobin, formerly of the company's home sales office in Kansas City.

Oberman Iron & Supply Co., 3328 North Broadway, St. Louis, has been organized to distribute structural steel and pipe to the construction industry.

Webster & Hedgcock Tractor & Equipment Co., has opened offices at 2120 South Seventh Street, St. Louis, as a distributor of Allis-Chalmers heavy industrial machinery.

E. F. Houghton & Co., distributing oils and leathers for the industrial trade, has moved its St. Louis branch office from 418 North Third Street, to the Mart Building.

Lewis Union Signs "Craft" Agreement With Railroad

JOHN L. LEWIS' SWOC, a bitter foe of the craft union organization of William Green's American Federation of Labor, has signed an agreement with the Union Railroad Co. recognizing individual classes of workers and making provisions for various shop crafts.

Some observers saw in the Union Railroad (a U. S. Steel Corp. subsidiary) contract a moving away from Lewis' strong stand for purely industrial unions. The SWOC itself described the contract which provides the 8-hr. day, with time-and-a-half for all over 8 hr. and establishes 45 wage classifications, as "perhaps the most unusual contract ever negotiated by the SWOC." Covered by the agreements are the following departments:

1. Locomotive shops, including painters, carpenters, tender repairmen, machinists, boilermakers, blacksmiths, electrical workers, sheet metal workers, pipe fitters, welders and common laborers.

2. Car shops, including car repairmen, car inspectors, painters, pipe fitters, carpenters, machinists, blacksmiths, welders and common laborers.

3. Maintenance of way department, including bridge carpenters, bridge repairmen, blacksmiths, welders, painters, maintenance men and common laborers.

4. Coal docks, including cranimen and common laborers employed therein.

5. Store departments, including electric truck operators, automobile truck operators, material handlers and common laborers.

While the Union Railroad's 1200 workers are organized, according to the SWOC, into an industrial union, 11 representatives of craft group signed the contract with the railroad's management.

Machine Tool Dealers To Meet at Dearborn

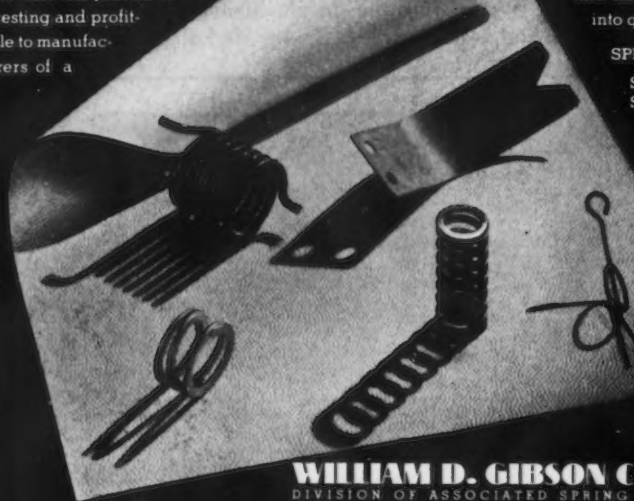
THE annual spring meeting of the Associated Machine Tool Dealers will be held May 23 and 24 in Dearborn, Mich. Among the speakers will be W. J. Cameron, Ford Motor Co.; Henry Weaver, General Motors Corp., and David A. Wallace, vice-president, Chrysler Corp.

Don't overlook SPRINGS when you modernize your mechanisms

Why continue to use the same old spring in your redesigned motions without investigating the possibilities of increased performance from this part, also? Gibson metallurgists are continually prying into the characteristics of new spring materials to determine their full range of usefulness and suitability. This information, plus an ability to put it to practical use, has proved interesting and profitable to manufacturers of a

great variety of products using springs. The size of your order is no bar to obtaining quality springs. Gibson puts the same effort into small orders as into quantity runs.

SPRINGS
SMALL
STAMPINGS
WIRE
FORMS



WILLIAM D. GIBSON COMPANY
DIVISION OF ASSOCIATED SPRING CORPORATION
1800 CLYBOURN AVE. CHICAGO, ILL.

GIBSON-SPRINGS



●
**ANY
METAL**

●
**ANY
PERFORATION**

● Perforated metal is for a thousand uses, some of which require precision workmanship to accomplish results otherwise impossible.

Whatever you require in perforated metal, we are here to produce, either the commonplace, the difficult, or the precision. Your inquiries will have our best attention.

The
Harrington & King
PERFORATING CO.

5657 FILLMORE ST., CHICAGO

114 LIBERTY ST., NEW YORK

Third Machine Tool Electrification Forum Held at East Pittsburgh

PROBLEMS relating to the application of motors, controls and other electrical equipment were discussed at the third annual machine tool electrification forum held by the Westinghouse Electric & Mfg. Co., at East Pittsburgh, May 9-11.

Advances in standardization of elec-

trical equipment; new design trends particularly for machine tool application; use of gearmotors; production results from a modern planer with an improved variable voltage, wide speed range, reversing drive; use of instruments in machine tool design and in testing; and improvements in control

equipment were among the topics discussed.

The forum comprised four formal sessions, with 16 papers, and four inspection tours, a dinner meeting, and the usual annual dinner and entertainment, the latter, the concluding event.

With a registration of 110, the attendance well exceeded that of both the 1937 and 1936 forums. It included more than 66 representatives of some 48 machine tool building companies, 12 representatives of five machine tool dealers, and seven representatives of other machinery builders and users of machine tools. More than two-thirds of these companies were represented at one or more of the previous Westinghouse forums.

The National Machine Tool Builders' Association was represented by its president, H. W. Dunbar vice-president, Norton Co., Worcester, Mass., and by its general manager, Tell Béna, both of whom made brief addresses.

Recent Motor Standardization

Standardization activities by motor manufacturers since the 1937 forum were outlined by T. R. Lawson, Westinghouse motor division sales, at the opening session, devoted to motors.

In respect to built-in motor standardized dimensions, it was stated that considerable work has been done by electrical manufacturers in establishing suggested standard ratings for given diameters and standard pertinent dimensions for built-in motor parts. As to a standard of motor balance, Mr. Lawson said: "We are somewhat further along than we were last year, but it is difficult to predict how soon we will be able to arrive at the limits of balance which will be standardized." A very complete standardization of terminal markings, sponsored by NEMA, is now being considered by the American Standards Association.

Motor Accessibility Desirable

The desirability of mounting motors so that they will be accessible for inspection and maintenance was emphasized by W. S. Risser, Westinghouse works equipment department, in an address on "A User's View of Motor Application."

Proper selection of control equipment was held to be as important as the motor, from the standpoint of the user of machine tools. If the control is built into the machine it should be as accessible as the motor. We like to see the built-in control as rugged as possible with as large a current-carry-



KINNEAR
ROLLING GRILLES

Protection
THAT OPERATES LIKE A WINDOW SHADE

A new type of protection for any opening against trespassing, burglary or intrusion. Ideal for blocking off corridors, gateways, concessions, entrances, etc. Unnoticed when open—but when closed an impassable barrier that affords the advantages of air, light and vision. Remarkable strength is combined with window shade convenience. They save space, are easy to operate and are economical to permanently install. Architecturally attractive and built in any size or metal, for motor or manual operation, the Rolling Grille is ideal for any building, old or new. Write for details.

The KINNEAR
Manufacturing Company
1760-80 Fields Ave. Columbus, Ohio

IMPASSABLE
BARRIER
plus
AIR
LIGHT
VISION

ing capacity as consistent with the small dimensions required for internal mounting, he said.

The question of the wiring of machine tools has been given serious consideration by both builder and user of machine tools. This particular item has improved somewhat over the past. All of our wiring is put in conduit either solid or flexible, and stranded wire is used, as solid wire may break due to vibration, said Mr. Risser. Loose wires on the inside of a machine may cause a great deal of trouble and lost time, due to shorts and grounds.

R. S. Marthens, manager, Westinghouse gearing division, addressed the forum on "Gearmotors to Replace External Speed Reductions." The gearmotor, born of the depression, is applied in exactly the same manner as a slow speed motor, he pointed out. After describing briefly the four types of horizontal gearmotors made by his company, Mr. Marthens commented on their possible economy in meeting special motor requirements. The session was followed by inspection of the manufacture and testing of gearmotors at the Westinghouse Nuttall works.

Urges Forethought in Electrification

In an outstanding address on "Build Electrical Control As An Integral Part of the Machine," R. S. Elberty, electrical engineer, Landis Tool Co., Waynesboro, Pa., pointed out that machine tools should be electrified while still on the drawing board.

Many objectionable features of electrified machine tools are due to the fact that the last and least consideration in the design of these machines was the electrical equipment, he said. "Forethought in the application of electrical equipment while the machine is still in the design stage will pay big dividends in reduced costs, and better performance and appearance of the completed machine."

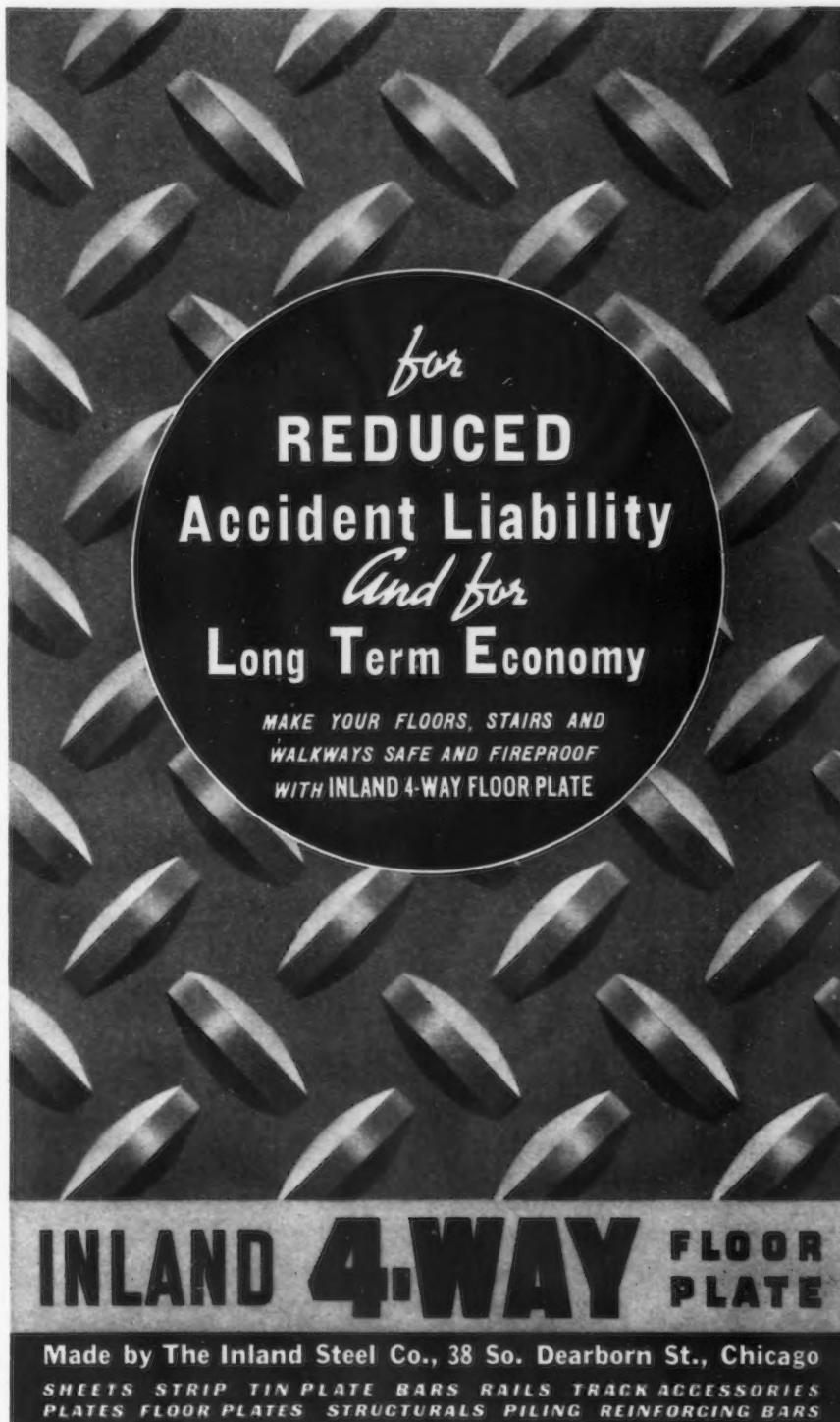
The practice of the Landis company in applying built-in controls to cylindrical grinders was outlined. In discussing accessories, which, it was said, should meet NEMA standards for 600 volts, Mr. Elberty listed a number of items "that we would like to see the electrical companies develop for machine tool electric drives."

"Application Data for D.C. Braking and Reduced Voltage Plugging," a paper by W. I. Bendz, Westinghouse district manager, Boston, was a feature at the same session. Frequently one of the requirements of a drive is to stop within a desired time or given

elapsed number of revolutions. Common practice in the past has been to use the motor for starting but to employ a separate device such as a magnetic friction brake for the function of stopping. There is no fundamental reason, said Mr. Bendz, why a motor should not be made to perform both duties and thereby eliminate one unit that is sometimes a source of unwarranted complication. The paper presents application data for two schemes by which this may be accomplished.

Variable Voltage Drive Applied to Planers

In an excellent paper on "Planer Drives," John E. Doran, sales manager, G. A. Gray Co., Cincinnati, outlined the evolution of such drives, from the hand-operated chain drive on a machine built by Richard Roberts in 1817 to the present variable voltage, wide-speed range reversing drive. Comprehensive data were given as to how the improved variable voltage drive meets the requirements of



for
REDUCED
Accident Liability
And for
Long Term Economy

MAKE YOUR FLOORS, STAIRS AND
WALKWAYS SAFE AND FIREPROOF
WITH INLAND 4-WAY FLOOR PLATE

INLAND 4-WAY FLOOR PLATE

Made by The Inland Steel Co., 38 So. Dearborn St., Chicago

SHEETS STRIP TIN PLATE BARS RAILS TRACK ACCESSORIES
PLATES FLOOR PLATES STRUCTURALS PILING REINFORCING BARS

smoothness, accuracy of reversal, high rate of acceleration and deceleration, wide-speed range, good speed regulation, reliability, safety, etc.

Production results on a 42-in. Gray planer equipped with the variable voltage drive described by Mr. Doran were outlined by C. W. Heppenstall, Jr., general manager, Heppenstall Co., Pittsburgh. The paper includes comparison with a 36 x 36-in. x 18-ft. Gray planer with a 25-hp. conventional constant voltage motor and con-

trol. It was stated that for equivalent planer construction a minimum increase of 15 per cent can be expected by using a variable voltage drive.

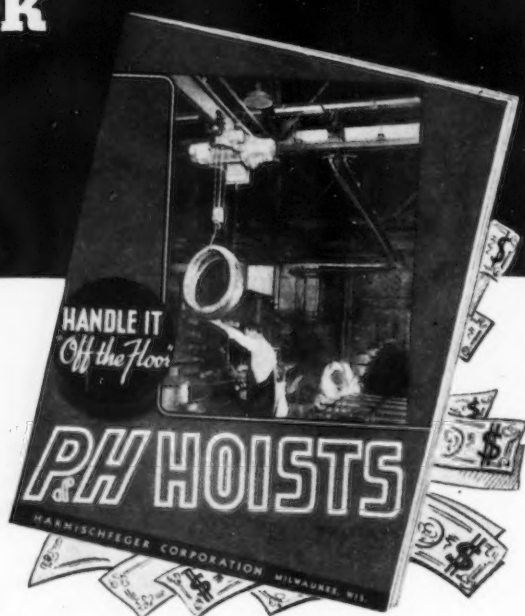
Variable voltage drive is also a feature of a special machine recently completed for machining the blades of ship propellers, described in a paper on "Propeller Planer or Shaping Machine," by H. Earl Morton, president, Morton Mfg. Co., Muskegon Heights, Mich., and O. G. Rutemiller, Westinghouse district engineer, Detroit.

The authors likened the operation of this machine to the cutting of screw threads with a 20-ft. pitch on an outside diameter of 15 ft. and a root diameter of 3 ft. The operations are performed for the most part by draw-cut shaping, but the machine is capable of milling, rotary planing, and push-cut shaping. The design required a rather great extreme in speeds for feed and traverse motions. Details of the electrification, including the use of a Westinghouse measuring relay feed drive are interestingly set forth by the authors.

(TO BE CONCLUDED)

THERE'S MONEY IN THIS BOOK FOR YOU

Get
Your
Copy
Now!



The ideas in this book are worth hundreds of dollars in showing you how to shave those "hidden costs" in your shops, loading zones, storage rooms or wherever materials must be moved. You'll find page after page of suggestions for efficient, cost-cutting applications of P&H Hoists in all types of material handling processes—in machine shops, foundries, canneries, mills, warehouses, etc. If you think that you've cut your costs to the bone—send for this book! You'll be surprised at the added economies it makes possible now—when you need them most. Ask for bulletin H-5. Address the Harnischfeger Corporation, 4401 W. National Ave., Milwaukee, Wis.

HARNISCHFEGGER CORPORATION

HOISTS • WELDING ELECTRODES • MOTORS  EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

Rockford Holds Tool, Machinery Display

CHICAGO.—The May meeting of the Rockford, Freeport and Beloit chapter of the American Society of Tool Engineers, Inc., included a display of tools and machinery by 14 Eastern and Middle Western manufacturers. Held at the Hotel Faust, Rockford, the meeting attracted several hundred members and guests. A. T. Cox, Jr., manager, Lincoln Electric Co., Moline, Ill., gave an illustrated lecture at the technical session on "Design for Welding."

Among the exhibitors were: Atwood Vacuum Machine Co., Rockford; Danly Machine Specialties Co., Chicago; Fairbanks, Morse & Co., Beloit, Wis.; Hoefer Mfg. Co., Freeport, Ill.; Lincoln Electric Co., Cleveland; Logansport Machine Inc., Logansport, Ind.; McCrosky Tool Corp., Meadville, Pa.; Midwest Tool & Mfg. Co., Detroit; Neilsen, Inc., Lawton, Mich.; and Whitman & Barnes, Inc., Detroit.

Northwestern Barb Wire Company Changes Name

SHAREHOLDERS of the Northwestern Barb Wire Co., Sterling, Ill., have approved changing its name to Northwestern Steel & Wire Co.

"Continuous growth and expansion of the business with increased facilities and greater diversification of products pointed the way to this new company name, as it clearly expresses to the trade the entire scope of our business which now includes the Sterling line of electric steel billets, rods, bars, bands, angles, shapes; also nails, barbed wire, fencing, netting, bale ties, hardware cloth and related items," James C. Foster, president, said.

Heavy Steels More Active in First Quarter of 1938 Than in Comparable Depressed Period of 1934

THAT depression periods in the steel industry do not affect all products alike is revealed by a comparison of the production records of the American Iron and Steel Institute for the first quarters of 1934 and 1938. These two periods were selected for comparison because the seasonal influences should have been about the same.

Total production in the two periods was close enough to afford a reasonably accurate picture of the manner in which important products were affected by the varying conditions in the fields which the steel industry serves.

Production of semi-finished and finished steel for sale, less shipments to members of the industry for further conversion, amounted to 4,206,857 gross tons in the first quarter of 1934 and to 4,011,439 tons in the first quarter of 1938. The 1934 production was equal to 36.6 per cent of the industry's finishing capacity and that of the 1938 quarter was 33.3 per cent.

The first great dissimilarity in the production figures of the two quarters is that the amount of ingots, blooms, billets, slabs and sheet bars sold for further conversion in the 1934 quarter was 993,698 tons, while in the 1938 quarter it was only 325,727 tons. The steel sold for further conversion is not included in the totals given in the preceding paragraph.

Building Activity Greater

It is clear that building construction activity was greater in the first quarter of this year than in the 1934 quarter. Shipments of heavy structural shapes in the 1934 quarter were 231,454 tons, while in the 1938 quarter they were 307,795 tons. Shipments of plates were 233,870 tons in the 1934 quarter and were 311,837 in the 1938 quarter. Concrete reinforcement took 100,445 tons in the 1934 quarter and 138,306 tons in the 1938 quarter.

Pipe and wire products were two of the fairly bright spots in the first quarter of this year as compared with the 1934 quarter. The total of all tubular products shipped in the 1934 quarter was 299,946 tons, while in the 1938 quarter it was 488,012 tons. The amount of all wire products, including rods, shipped in the 1934 quarter

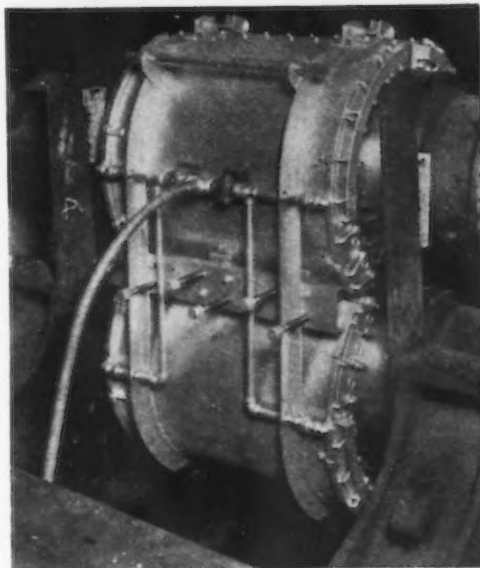
was 385,165 tons, while in the 1938 quarter it was 411,271 tons.

Strip Steel Dropped Sharply

The influence of the low volume of buying by the automobile industry is

plainly shown in a comparison of the figures for bars, sheets and strip, particularly strip. Merchant bar total dropped from 458,998 tons in the first quarter of 1934 to 354,448 tons in the first quarter of this year. Cold-finished steel bars (carbon) dropped from 86,663 tons to 52,763 tons. Sheets totaled 999,750 tons in the 1934 quarter and 788,388 tons in the 1938 quarter. A much sharper drop occurred in strip steel—from 520,300 tons to 232,854 tons. Railroad buying was

*Got an Old Envelope?
or Tablecloth Handy?*



*(Or... never mind...
we'll make ciphering
space for you below).*

Reach for your pencil... the answer to this one is not in the back of the book. You'll have to figure it out for yourself.

Brass tacks on Radiatube, the new two-high roll-heater by Kemp of Baltimore: Six cubic feet of natural gas or 12 cubic feet of coke oven gas, will do the work of one kilowatt hour of electricity. Calculate over the week-end, what that means in dollars in your mill. Figure what it means over the year. Then reach for your phone, buzz for your secretary, or

SOMETHING... Get in touch. Address The **C. M. Kemp Manufacturing Company** at 405 East Oliver Street, Baltimore, Maryland... or Oliver Building, Pittsburgh, Pennsylvania for complete details on spectacular performance in cost cutting. Time-saving is just an extra bonus thrown in for good measure.

KEMP of BALTIMORE

also less in the first quarter of this year than in the corresponding 1934 quarter. Heavy rail shipments were 213,685 tons in the 1934 quarter against 199,578 tons in this year's first quarter. The total of rolled steel carwheels, axles and track spikes in the first quarter of 1934 was 52,018 tons; in this year's quarter, 36,903 tons.

Tin mill products, usually quite active in the first quarter of every year regardless of depressions, recorded a

total of 443,591 tons in the 1934 quarter against 418,787 tons in the 1938 quarter, a reflection of this year's heavy stocks of tin plate carried over from 1937.

Exports constituted a much larger proportion of total steel production the first quarter of this year than in the first quarter of 1934. This year's quarterly total was 459,902 tons, or more than 10 per cent, against 219,728 tons, or a little more than 4 per cent in 1934.

..PERSONALS..

HARRY F. DEVENS, president for the past five years of the Oliver Iron & Steel Corp., Pittsburgh, has been made chairman of the board. THEODORE F. SMITH, heretofore executive vice-president, has been elected president.

♦ ♦ ♦

WILLIAM S. RICHARDSON, merchandising manager of B. F. Goodrich Co., mechanical goods division, Akron, Ohio, has been named general sales manager of the same division succeed-



PRODUCTS
Steel Castings
Forgings
Roller Wheels
Heavy Springs
Roller Rings
Gear Blanks

**THE PLACE TO BUY
 HEAVY FORGINGS**

Standard is a prompt source of supply for heavy forgings whether they be relatively simple like this 5,600 lb. forged ball drop or more complex like the 14,300 lb. forged crankshaft pictured here.

Standard's forgings and castings, too, are made from open hearth steel produced under close metallurgical control in our own furnaces.

STANDARD STEEL WORKS CO.
 Subsidiary of the
 Baldwin Locomotive Works
 BURNHAM PENNA.

STANDARD



H. F. DEVENS



T. F. SMITH

ing C. E. Cook, who died April 16. Mr. Richardson joined the Goodrich organization in 1926, was staff superintendent of mechanical rubber goods production and in 1931 was appointed merchandising manager. L. H. CHENOWETH becomes the new merchandising manager. He has been assistant merchandising manager since 1931.

♦ ♦ ♦

J. M. McKENZIE, purchasing agent for West Steel Casting Co., Cleveland, since 1922, is leaving to join the Cleveland Metal Abrasive Co., Cleve-

land, as treasurer in charge of sales and buying.

♦ ♦ ♦

W. J. McARDLE has resigned as general sales manager of Allegheny Steel Co., Brackenridge, Pa. Mr. McArdle was with the company for 20 years, during which time he was closely identified with the development as well as the expansion of electrical and stainless steels. He plans to resume his business activities in Pittsburgh after a short vacation.

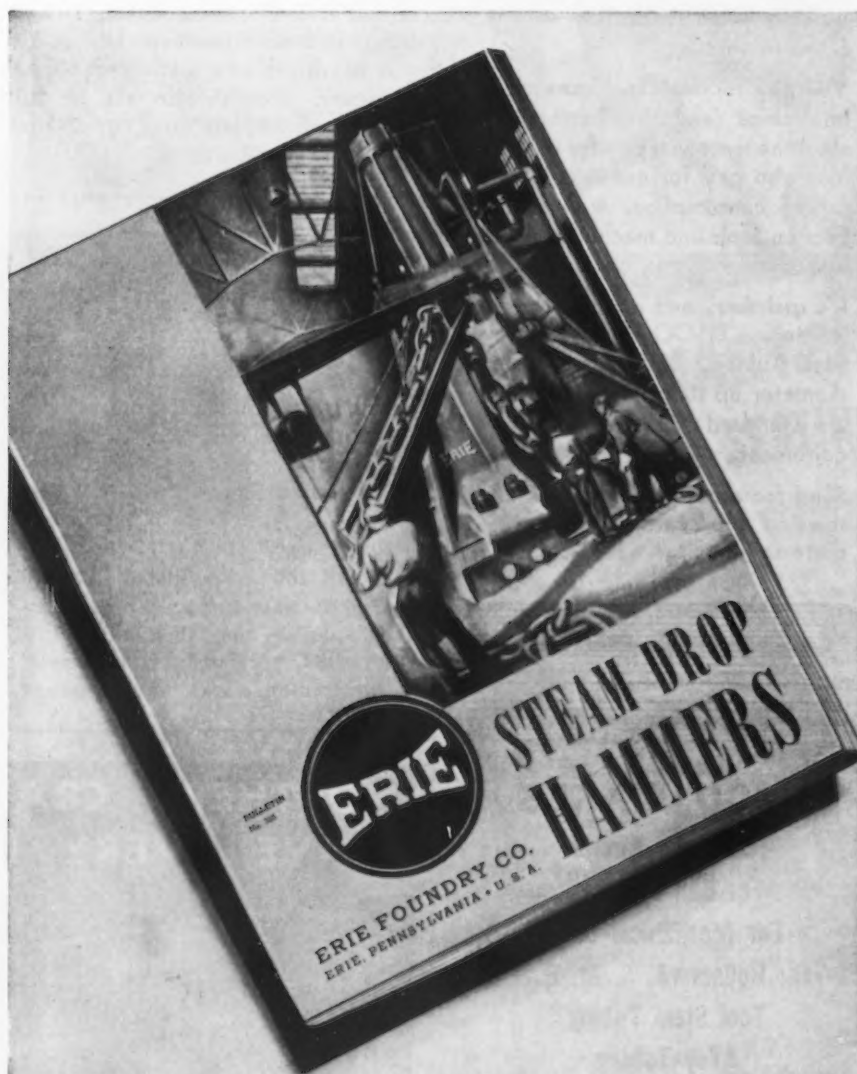
ANDREW W. SODERBERG, originator of the "rocking shear" principle for cutting wide steel plate, will retire May 31 as chief engineer of the Homestead works of Carnegie-Illinois Steel Corp., Pittsburgh. Another accomplishment of Mr. Soderberg was the electrification of the structural mills at Homestead. He also constructed, in 1936, the 100-in. semi-continuous plate mill. Mr. Soderberg was employed at Homestead by the former Carnegie Steel Co. on Dec. 2, 1889.



W. S. RICHARDSON



L. H. CHENOWETH



*500 Forge Shop Men
will want this New
Erie Catalog!*

USE BISCO TUBING

DON'T WASTE

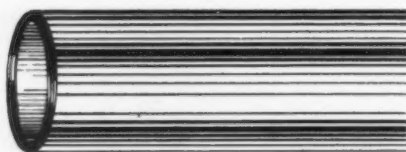
— good steel
— and labor

It's not difficult to make rings and bushings from solid steel—but it is wasteful.

You pay for the steel converted into chips (and the better the steel the more you pay for waste). You also pay for needless labor, power consumption, wear and tear on tools and machinery, and lots of other things. . . .

It's *quicker*, and more economical to use BISCO alloy and Tool Steel Tubing. You can get any diameter up to 14 inches. There are standard sizes for every requirement.

Send for a copy of our stock list showing sizes carried for immediate shipment.



BISCO MAKES

Tubing for Aircraft
For Ball Bearings
For Mechanical Uses
For Boilers (A. S. M. E.)
Tool Steel Tubing
Alloy Tubing
Cold Drawn Tubing
Stainless Steel Tubing

THE BISSETT STEEL COMPANY

945 East 67th St.,
CLEVELAND, OHIO
1036 West Lake St., Chicago, Illinois
367 Main St., Buffalo, N. Y.

ORDER FROM

STOCK

and in 1902 became assistant chief mechanical engineer. He was appointed chief mechanical engineer in 1915 and chief engineer in 1937. He is a member of the Association of Iron and Steel Engineers and the American Iron and Steel Institute.

♦ ♦ ♦

R. J. SCHULER, formerly general manager of sales of the LaSalle Steel Co., Chicago, has joined the general sales organization of Republic Steel Corp. in the capacity of general sales representative of the Union Drawn Steel division, Massillon, Ohio. He was identified with LaSalle Steel for 13 years. For the present he will make his headquarters in the Detroit offices of Republic Steel.

♦ ♦ ♦

A. F. WHITE, formerly superintendent of the Donora steel works, American Steel & Wire Co., Cleveland, has been made general superintendent of the Donora steel and wire works, which is a consolidation into a single plant of the Donora steel works and the Donora wire works at Pittsburgh. J. C. WITHERSPOON, who has been superintendent of steel production, becomes assistant general superintendent of the consolidated plant in charge of blast furnaces, open hearth and blooming and billet mills. H. R. PATTERSON, previously superintendent at the Rankin works, has become as-



R. J. SCHULER

sistant general superintendent at Donora in charge of rod, wire and wire product mills, while C. J. BROWN has assumed the superintendency at Rankin. Effective June 1, E. C. MORRISON becomes superintendent of industrial relations, Pittsburgh district of the American Steel & Wire Co., and IRA GRIBBEN is appointed assistant to the manager of the district. Mr. Gribben is now district personnel supervisor and Mr. Morrison has been superintendent of the Anderson, Ind. works.

NORTHERN CRANES AND HOISTS SERVE EVERY INDUSTRIAL NEED



NORTHERN ENGINEERING WORKS

NEW YORK CHENE AND ATWATER STS. CHICAGO DETROIT, MICH. PITTSBURGH WINDSOR, ONT.

F. B. DeLong has been appointed manager of sales of the Los Angeles district office of Columbia Steel Co., subsidiary of United States Steel Corp., succeeding A. G. Brown, who has resigned.

Mr. DeLong is a native of Sparta, Wis., and was educated at the University of Wisconsin and the University of Minnesota. His first job was with the U. S. Geographical Survey in 1910 as junior topographer. Later he entered selling, joining the Crane Co. at Portland, Ore. In 1917 he was employed as general superintendent of power and heating by the James Smyth Co. The following year he joined the Walworth Co. as Pacific Northwest manager at Seattle, then went to Chicago as the company's Mid-western manager. In 1922 he formed his own company in Seattle,

selling tubular products. He later sold the business and went to Los Angeles to join Columbia Steel as manager of tubular, alloy and stainless products.

♦ ♦ ♦

L. F. ADAMS has been made head of the new standards department of General Electric Co., Schenectady, N. Y. The department has been formed to better coordinate activities in the development and application of standards both within the company and without and centers in one organization the work formerly done by smaller groups in the various General Electric plants. Mr. Adams will serve as manager and will be assistant to E. O. SHREVE, vice-president. Associated with Mr. Adams will be E. B. PAXTON, E. R. ANDERSON, H. W. SAMSON, and H. W. ROBB.

(CONTINUED ON PAGE 65C)



**PAGE
HI-TENSILE
"C"**

*for Speed
and Profit*

● Jobs that require welding in all positions—overhead, vertical and horizontal—jobs that must stand rigid inspection and meet high strength requirements—jobs that must be put through in limited time—are handled to best advantage with Page Hi-Tensile "C" Electrodes.

Hi-Tensile "C" has speeded up many jobs, reduced many cost records. It is a quiet, steady electrode that causes very little spatter and slag loss. Used with greatest convenience and efficiency when work must be done in close quarters. Adaptable to production, maintenance and repair work.

Your local Page distributor will show you how Page Hi-Tensile "C" and other Page Electrodes speed up work and increase profits.

PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE COMPANY, Inc.
MONESSEN, PENNSYLVANIA

In Business for Your Safety



PAGE *Welding* **WIRE**



..of **HARTER
POSTURE SEATING**

● SHE KNOWS that correct posture reduces fatigue, permits normal functioning of vital organs, improves health and increases efficiency. She also knows that Harter Posture Chairs are designed to make correct posture easy and natural.

The very latest, the big news, however, is that the new Harter Posture Chair is absolutely self-fitting. This is doubtless the most outstanding development in posture chair history—it banishes all need of service and the service man. In this wonderful new chair correct posture and practical comfort are joined with instant and positive self-adjustment.

There is a Harter Posture Chair for every type of seated work. Harter also produces smartly styled steel chairs for modern offices.

FREE! Write for: "Fired"—tells about the passing of the service man and gives details on Self-Adjustment Posture Seating.

The **HARTER Corporation**
DESK 558
STURGIS, MICHIGAN
MANUFACTURER OF THE WORLD'S
FINEST Steel SEATING EQUIPMENT

HARTER
Self Fitting
POSTURE CHAIRS

Sheet Distributors Ask Mills For Consultation On Prices

CLEVELAND.—National Association of Sheet Metal Distributors, holding its 27th annual meeting here May 16-17 adopted a resolution requesting that mills give a hearing to a committee of the association whenever changes in the price set-up or extras are contemplated. When members reported they understood a price change was contemplated soon, the association requested a joint meeting with mills immediately.

The association reaffirmed its action at the last annual meeting of favoring retention of the distributors' differential.

Discussing recent price legislation and its effect upon distribution, Prof. H. H. Maynard, Ohio State University Department of Business, told the association Monday afternoon that any organization which can justify a preferential discount is in order under the Robinson-Patman Act, and that the FTC in his opinion is not inclined to attack the principle of functional discounts.

Enforcement Is Problem

Pointing out that 43 states, including Mississippi, have adopted their own fair trade practice laws, Prof. Maynard said undoubtedly mills branding their own sheets would be able to set up price schedules for the consuming trades under the state fair practice laws, and then it would become a felony for a retailer to undersell in that state. The speaker warned, however, that one of the biggest problems in establishing minimum resale prices would be the problem of enforcement machinery.

Concerning economic justifications for the functional discount, Prof. Maynard said it should be given on the assumption that a distributor performs valuable services such as storage, acting as a purchasing agent for his customers, analyzing their probable wants, giving credit assistance, maintaining a sales organization; and giving merchandising service and advice.

Delegates at the Monday morning session heard John H. Van Deventer, editor, THE IRON AGE, assert that "American public opinion, which a

year ago halted John L. Lewis in his Government-sponsored march toward a labor dictatorship, is now forming an equally decisive command which shortly will be issued to check the current business depression."

Depression "Man-made"

Mr. Van Deventer, whose topic was "Sheet Steel's Future is Still in Front," said, "The American people are preparing to warn those in power to compose their differences with business and put an end to outrageous taxation which takes dollars from laborers' pay envelopes and dividends from investors."

Attributing the current slump to lack of confidence, mainly due to labor troubles, Mr. Van Deventer declared that "there is hope in the fact that this is a man-made depression" and thus may result in a recovery as swift as the decline.

"The public mind is all powerful and when it gets to work it forms an irresistible force against which both plutocrats and politicians are helpless," Mr. Van Deventer told the sheet metal convention. "I do not think that common sense will permit us to travel much longer down the road of poverty when we have the ability and the resources at every hand to achieve prosperity."

"The immediate prospects of the steel industry are not as bright as the long-term outlook and I do not think that you are going to see very much of an upturn until well into the third quarter. There is no material reason why we should have had this precipitous decline. We had plenty of money, plenty of credit, we had high wages and good demand. The one factor that was lacking was the psychological factor of investor confidence."

A Roosevelt Depression

"Thus with confidence gone, we had the unusual spectacle in America of an unwarranted depression. To my mind, it is far more a Roosevelt depression than the great depression beginning in 1930 was a Hoover depression."

When the public acts to check the slump, the nation will see the beginning of a new day for capital, for

labor and for the steel industry, Mr. Van Deventer told the convention.

Congressman-at-Large Harold G. Mosier, Cleveland, former lieutenant governor of Ohio, told the delegates that the wages and hours bill, the only important piece of legislation remaining before Congress, will pass the house easily on May 23 and its fate will rest in the Senate where a possible filibuster may develop. If the rates are uniform, the Congressman said he would favor the bill, but he pointed out that cheap TVA power in the South threatens to lure industry from the North.

Home Modernizing Helps

Bruce Wilson, Federal Housing Administration, Washington, discussed possibilities under the National Housing Act. Following this speech A. W. Howe, Cleveland, president of the Sheet Metal Distributors Association, pointed out that his company, J. M. & L. A. Osborn Co., this year was enjoying a greater volume of home modernization work brought about through contracts under FHA than last year, 99 per cent of the total business being local.

Mr. Howe presided at the Monday morning session and Robert H. Lyon, Lyon-Conklin & Co., Inc., Baltimore, presided at the Monday afternoon session. The association's annual dinner was held Monday night with Major Norman A. Imrie, Columbus, Ohio, as the speaker.

The distributors reelected present officers of the association including, A. W. Howe, J. M. & L. A. Osborn Co., Cleveland, president; Robert H. Lyon, Lyon-Conklin & Co., Inc., Baltimore and A. J. Becker, Ohio Valley Hardware & Roofing Co., Evansville, Ind., vice-president; George A. Fernley, secretary-treasurer and P. F. Hord, assistant secretary-treasurer. H. E. Usinger, Berger Brothers Co., Philadelphia, and Bruce Haines of E. E. Souther Iron Co., St. Louis, were elected to the executive committee.

Tuesday morning the delegates heard Charles R. Hook, president, American Rolling Mill Co., Middletown, Ohio, and president of National Association of Manufacturers, discuss constructive proposals which have been advanced by business toward the solution of the nation's economic and social problems. Mr. Hook told of the need for a competent tax commission to study and remove disturbing tax problems.

RFC Railroad Bill Modified; No Strings on Maintenance Loans

WASHINGTON.—The House Banking and Currency Committee last week reported favorably a revised railroad financing bill which proposed no change in the equipment loan provision of its predecessor, the Steagall bill, but which struck out that requirement that roads obtaining work-loans must use 75 per cent of the funds for rehiring employees and the balance for track maintenance and replacement purchases.

The revision, sponsored by Representative Goldsborough, Democrat, of Maryland, would leave the ratio of equipment and labor expenditures on the work loans up to the RFC and the roads would not be limited to rehiring only workers separated from employment since Sept. 1, 1937, as was specified in the Steagall bill. No strings were attached to the straight equipment loans with which the railroads could purchase rail and shop appliances, new rolling stock and other equipment.

The Senate draft of the bill, a companion measure to the Steagall proposal, is expected to be amended to bring it into line with the Goldsborough version.

The loans would be available from RFC's \$1,500,000,000 lending capacity opened up under the Glass-Steagall law but Chairman Jesse H. Jones has estimated that the roads might not borrow more than \$100,000,000 under the pending bill. The RFC has had authority to make railroad loans with ICC approval but with some roads not earning their fixed charges and others not even earning operating expenses. ICC certification could not be given. Under the procedure outlined in the pending proposals, a railroad equipment loan would still require ICC approval but the RFC is empowered to okay the loan if it finds "reasonable assurance" of repayment and that the value of the security offered, such as the purchased equipment, is sound.

The RFC railroad loan bill was opposed during the course of public hearings by counsel for security holders of roads being reorganized. They complained that the bill would interfere with reorganization plans by giving RFC power to sell collateral received for loans to bankrupt roads.

A bill sponsored by Representative Drew, of Pennsylvania, would set up

machinery for lending money to roads unable to meet fixed charges or taxes by collecting an emergency loan fund from a percentage of incoming freight revenue, tentatively fixed at 10 per cent. Loans would be partly secured by the assessment and collection of this surcharge although the administrative agency, a seven-man Emergency Transportation Loan Board, could disregard other security requirements if it so elected. The only tie-up with the ICC would be the membership of the board which, the bill provides, must include a member of the commission.

Allegheny, Ludlum Companies Merge

DIRECTORS of Allegheny Steel Co. and Ludlum Steel Co. on May 17 voted to merge the two companies, subject to approval of stockholders of both companies expected at meetings to be held Aug. 10.

The name of the new organization will be the Allegheny Ludlum Steel

Corp. One share of stock in the new company will be given for each share of stock of the two concerns. Directors will be chosen from the Ludlum and Allegheny boards with the number in proportion to assets of the companies. No plants will be eliminated and no additions will be made to melting capacity, according to the merger announcement.

Comparative figures on the Ludlum and Allegheny companies for 1937 follow:

	Allegheny	Ludlum
Ingot capacity (gross tons)	499,516	38,000
Net sales	\$36,573,419	\$13,054,202
Net income	\$1,813,707	\$1,120,422
Net profit margin....	5 per cent	8.6 per cent
Common shares	752,513	497,600
Earnings per share....	\$2.10	\$2.25
Total assets	\$20,794,596	\$11,020,464
Funded debt	none	none
Surplus	\$10,864,241	\$8,627,476
Invested capital	\$18,880,142	\$9,125,076

Allegheny manufactures ingots, blooms, billets and sheet bars, sheared plates, hot-rolled, annealed and cold-rolled sheets, stainless steel plates, sheets, strip, bar, tubes, angles and wire, welded pipe and boiler tubes and seamless mechanical tubes.

Ludlum produces tool and high-speed steels; stainless steels; heat corrosion and wear resisting steels, valve steels and Nitralloy and other products.



A SNACK at odd periods of the day is recommended for workers when hungry, tired or depressed. So a new "rolling cafeteria", especially designed for industrial service, filled with sandwiches, milk, coffee, ice cream, candy, pie and cake, appears in the aisles of the East Pittsburgh Works of the Westinghouse Electric & Mfg. Co., five times a day.

J. H. Hartman, manager of the Westinghouse employees' restaurants, who designed the equipment, first of its type ever built, states that by eating at odd periods, even as much as five times a day, fatigue is avoided and cheerful dispositions maintained. Westinghouse will operate three of the new "rolling cafeterias" under the supervision of the company's medical department.

..PERSONALS..

(CONTINUED FROM PAGE 65)

JAMES V. COULTER and GEORGE E. SIBBETT, well known in the Pacific Coast steel trade, recently formed a partnership to be known as the Coulter-Sibbett Steel Co. to engage in the jobbing of special steels at 240 Eighth Street, Oakland, Cal. Mr. Coulter was formerly employed by the Midvale Co., Philadelphia, but during the past 10 years has been district manager on the Coast for the Earle M. Jorgensen Co., agent for Bethlehem Steel Co. He has been active in the work of the American Society for Metals, being chairman of the Golden Gate chapter. Mr. Sibbett has also been identified with the steel industry for many years. After graduation from the Massachusetts Institute of Technology, he was with the Link-Belt Co. From 1914 to 1926 he was with the Columbia Steel Co., of which he was chief engineer for a number of years. Until recently he was vice-president and general manager of the Pacific States Cast Iron Pipe Co., Provo, Utah.

♦ ♦ ♦

HERBERT H. WALDSCHMIDT has been appointed director of purchases of Youngstown Sheet & Tube Co., Youngstown. Activities of the general purchasing department and the purchasing of raw materials will be consolidated under his direction June 1. A native of Pittsburgh, Mr. Waldschmidt became associated with Youngstown Sheet & Tube Co. in 1920 at its Pittsburgh office. In 1923 he was transferred to the general offices at Youngstown as assistant to the manager of the raw materials department. He has been manager of that department since 1928. C. T. MOKE will continue in the position of purchasing agent.

♦ ♦ ♦

H. D. McKNIGHT has been appointed traffic manager of National Screw & Mfg. Co., Cleveland. The company has announced the appointment of three assistant managers of sales as follows: B. H. JONES, in charge of general sales office; CHARLES W. BAKER, in charge of development of new products, research and sales engineering; HAROLD W. LAGANKE, in charge of certain accounts and special assignments. Some of the Cleveland territory formerly handled by Mr. LaGanke will be handled by GEORGE R. INGERSOLL, JR.

F. T. HAYS has resigned as superintendent of the Fort Pitt Steel Casting Co., McKeesport, Pa., to become works manager of the Warman Steel Casting Co., Los Angeles. JOHN MARR, formerly works manager of the Chicago Steel Foundry Co., Chicago, has been named to succeed Mr. Hays.

♦ ♦ ♦

H. T. HEALD was elected president of Armour Institute of Technology at the age of 34 at a meeting of the board of trustees last week. Mr. Heald has been with Armour Institute since 1927 and has served as assistant professor of civil engineering, associate professor and assistant dean of the school. Since 1934 he has served as full professor and dean and, since the resignation last October of Dr. Willard E. Hotchkiss, as acting president.

♦ ♦ ♦

HAROLD E. YALE, long associated with the automotive industry in Detroit, has been elected president of the Pyro-Electro Instrument Co., Detroit. CLARENCE E. SMITH is vice-president and chief engineer and CHARLES H. HITCH is secretary-treasurer. The company recently moved to larger quarters at 7323-25 West Chicago Boulevard, obtaining additional production facilities.

♦ ♦ ♦

W. E. REMMERS, of the Electro Metallurgical Sales Corp., was elected chairman of the Chicago chapter, American Society for Metals, at its monthly dinner meeting last week. Mr. Remmers succeeds ELMER GAMMETER of the Carnegie-Illinois Steel Corp. Other officers elected were: Vice-chairman, H. S. VAN VLEET, American Can Co.; secretary and treasurer, E. A. TERWEL, Driver-Harris Co.; and assistant secretary, E. A. ANDERSON, Revere Copper & Brass Co. Mr. Gammeter and K. H. HOBIE, who served as secretary-treasurer during the past year, were elected to the executive committee.

A feature of the meeting was a discussion of high-speed steel by NORMAN I. STOTZ, chief metallurgist, Universal-Cyclops Steel Corp., Titusville, Pa.

♦ ♦ ♦

LEWIS M. LIND, chief of the machinery division of the bureau of foreign and domestic commerce, Washington, D. C., has accepted an invitation to be the principal speaker at a dinner sponsored by the foreign trade division of the Milwaukee Association

of Commerce on May 24 in observance of National Foreign Trade Week. His topic will be "Could We Exist Without Foreign Trade?"

♦ ♦ ♦

HARRY M. STRATTON, vice-president of the Briggs & Stratton Corp., Milwaukee, has been elected a member of the board of directors of the Missouri Pacific Railroad.

♦ ♦ ♦

R. E. HUPPERT, general manager of the Federal Pressed Steel Sash Co., Waukesha, Wis., has announced the appointment of RALPH H. SARTOR as sales manager. Mr. Sartor has resigned as commissioner of the Metal Window Institute to accept the position. He was for 10 years engaged in engineering construction work on the Panama Canal, leaving there in 1917 to serve with the United States Army Engineer Corps, from which service he resigned as Major in 1919.

♦ ♦ ♦

HAROLD H. SEAMAN, president, and IRVING SEAMAN, secretary and treasurer of the Seaman Body Corp., Milwaukee, subsidiary of the Nash-Kelvinator Corp., Detroit, have announced their retirement from office effective May 31 to devote their entire time to private affairs. The firm was founded nearly 90 years ago by their grandfather, the late Alonzo D. Seaman, as a furniture manufacturing business, and continued by their father, the late W. S. Seaman. In 1909 the manufacture of closed automobile bodies was instituted.

JOHN WEILAND, who entered the plant in 1911 and was appointed general superintendent in 1922, has been appointed in general charge of the business for the Nash-Kelvinator interests.

♦ ♦ ♦

ODBERT P. WILSON, who has been identified with the Norma-Hoffmann Bearings Corp., Stamford, Conn., for the past 24 years, has been elected executive vice-president and treasurer.

♦ ♦ ♦

BORGE ROSING, for the past three years division sales manager of the International Derrick & Equipment Co., Columbus, Ohio, has been appointed general sales manager of the West Virginia Rail Co., Huntington, W. Va. He was formerly identified with the Mount Vernon Bridge Co.,

the American Bridge Co., and the Canadian Bridge Co. in various engineering capacities.

♦ ♦ ♦

CONRAD O. HERSAM, of the Industrial Consulting Engineering Co., Philadelphia, has been appointed sales representative in lower New York, Delaware, New Jersey, Maryland and eastern Pennsylvania for the Esco Engineering & Sales Co., Detroit. H. REYNOLDS, of 3346 Superior Street, Cleveland, will represent the company in Ohio.

♦ ♦ ♦

ELLIS C. FOLKENING and HOWARD G. WARWICK, who have been engaged in selling flat rolled steel in the Chicago territory for many years, have been appointed sales representatives for the Rotary Electric Steel Co., Detroit. They will make their headquarters at 20 North Wacker Drive, Chicago.

Supreme Court Agrees To Hear Republic Side

T. F. Patton, general counsel of Republic Steel Corp., announced Monday that the company's application to be heard in its own behalf next Monday by the United States Supreme Court in the matter involving the Third Circuit Court of Appeals ruling in the Labor Board case against Republic had been granted and that company counsel would appear in the case before the Supreme Court at that time.

CIO Dues Collectors Defy Court, Picket Case Plant

CHICAGO.—Operations were scheduled to be resumed at the Rockford, Ill., plant of the J. I. Case Co. Monday, but nearly a thousand pickets defied a circuit court injunction and refused admission to the plant of employees wishing to return to work. The pickets are members of the United Automobile Workers of America, which is conducting a drive for paid-up dues.

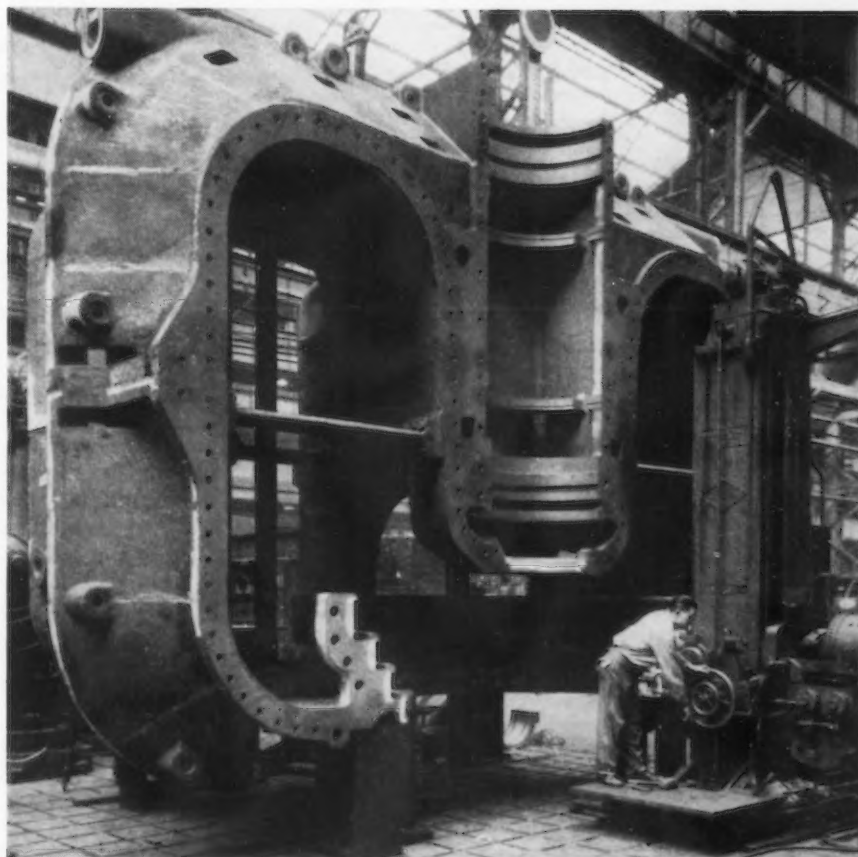
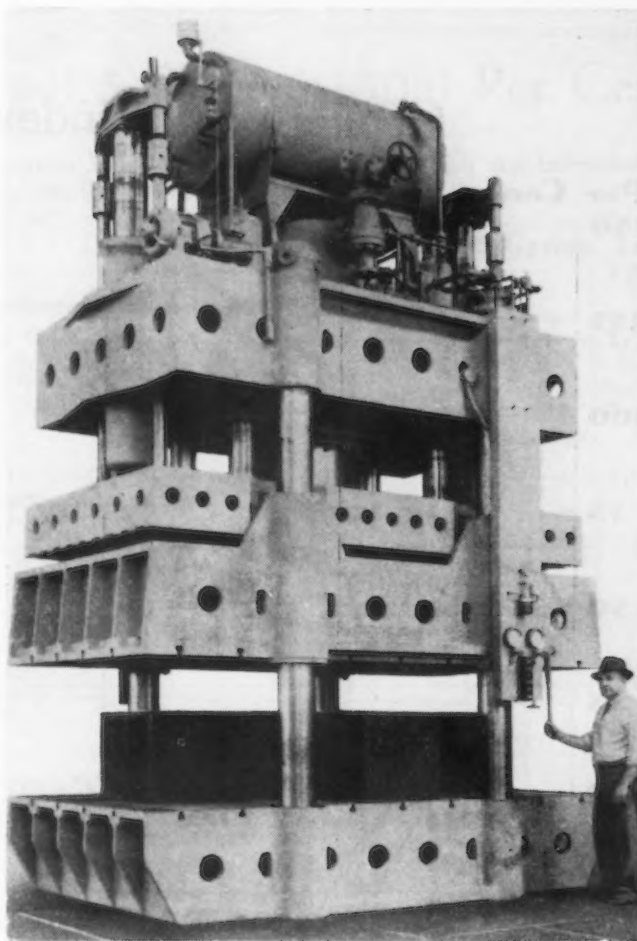
♦ ♦ ♦

SOMETIMES it is easier to bring the machine to the work than to move the work. Here a portable drilling machine has been brought into position to drill flange holes in the lower half of the exhaust hood of a large turbine under construction at the Schenectady works of the General Electric Co.

♦ ♦ ♦

HERE is a 100-ton American cradle for Russian airplanes. It's a giant hydraulic press built by the Lake Erie Engineering Corp., Buffalo, for the Soviet government. More than 75 tons of Niagara pig iron, a product of Republic Steel Corp., Cleveland, were used for the cast iron parts of the 3-ft. high unit. But size or weight is no handicap to speed. The press is geared to form large aircraft parts at the rate of two per minute. Russia has purchased six units and has options for more.

♦ ♦ ♦



Capital Goods Index Eases Off One Point



THE IRON AGE Weekly Index of Capital Goods Activity

(1925-27 = 100)

	Week Ended May 14	Week Ended May 7	Comparable Week	
			1937	1929
Steel ingot production	38.3	37.8	115.8	129.0
Automobile production	40.1	44.6	118.0	128.9
Construction contracts	62.0	61.6	59.2	126.1
Forest products carloadings	45.9	46.9	65.9	122.8
Production and shipments, Pittsburgh District	45.6	46.0	105.3	124.7
Combined index	46.4	47.4	92.8	126.3

LED by a sharp drop in automobile assemblies, THE IRON AGE seasonally adjusted index of capital goods activity eased off one point in the week ended May 14 to 46.4 per cent of the 1925-27 average. The drop in automobile assemblies lowered the adjusted index of this component to 40.1, 4.5 points below the previous week's position. A year ago the index stood at 118.

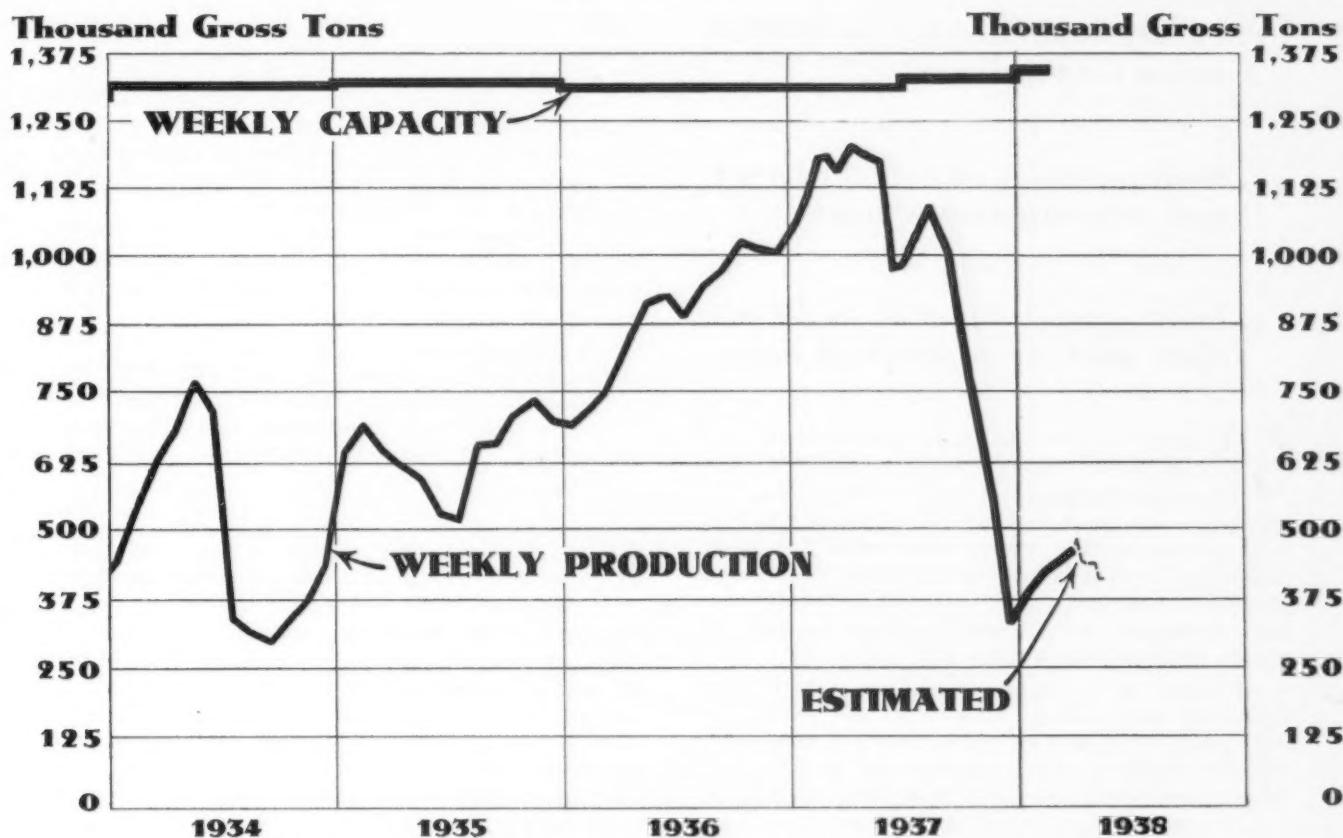
Smaller losses were recorded in both the lumber and the Pittsburgh series, with the Pittsburgh decline occasioned primarily by a greater-than-seasonal drop in the volume of originating shipments. Industrial production in that area was comparatively unchanged from the preceding week.

The index of steel works operations advanced slightly as the physical output remained unchanged against a declining trend. Contracts for the Delaware aqueduct in New York were chiefly responsible for raising the adjusted index of construction activity to 62, a gain of 0.4 points over the previous week. The week's dollar volume of heavy engineering awards was \$70,520,000, as against \$36,322,000 in the preceding week and \$62,701,000 in a corresponding week a year ago. Public works continue to account for the bulk of present construction activity, although it is encouraging to note that the week's awards included four covering private housing projects, totaling \$3,720,000. Three of these projects are located in the East and one in the Central States area.

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from Engineering News-Record.

Steel Ingot Output Declines 0.5 Point to 30.0 Per Cent

Average Weekly Production of Open-Hearth and Bessemer Steel Ingots by Months, 1934-1937, and Estimated Production by Weeks in 1938



Figures for the Current Week Are Not Indicated on the Chart Until the Following Week

STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

	Current Week	Last Week
Pittsburgh	29.0	26.0
Chicago	29.0	33.0
Valleys	26.0	29.0
Philadelphia	26.0	26.0
Cleveland	18.0	18.0
Wheeling	58.0	63.0
Buffalo	26.5	28.5
Detroit	19.5	19.5
Southern	48.0	49.0
S. Ohio River	40.0	40.0
Western	30.0	30.0
St. Louis	37.5	41.0
Eastern	10.0	10.0
Aggregate	30.0	30.5

Weekly Booking of Construction Steel

	May 17, 1938	May 10, 1938	Apr. 19, 1938	May 18, 1937	Year to Date 1938	Year to Date 1937
Fabricated structural steel awards.....	4,500	14,950	8,900	16,700	259,980	481,815
Fabricated plate awards.....	1,460	2,820	225	320	53,650	57,155
Steel sheet piling awards.....	0	0	2,255	0	10,425	16,525
Reinforcing bar awards.....	5,730	5,910	4,360	1,410	85,315	83,570
Total Lettings of Construction Steel.....	11,690	23,680	15,740	18,430	409,370	639,065

...SUMMARY OF THE WEEK...

... *Carnegie-Illinois likely to reaffirm prices for third quarter.*

o o o

... *Reclassification of flat rolled products only important change.*

o o o

... *Ingot production slips to 30 per cent; steel scrap prices go lower.*

STEEL prices for the third quarter were expected to be announced this week by the Carnegie-Illinois Steel Corp. with no changes except in the flat rolled classification, in which a new system of base prices and extras has been introduced as a step toward clarification of inconsistencies that have been brought about by the rapid growth of the continuous rolling method for sheets, strip and black plate.

Although some consumers had apparently been expecting some formal reductions in view of recent price irregularities, the anticipated reaffirmation of present prices is a logical and obvious outcome, considering the fact that any reductions would undoubtedly have affected wage rates. Opposition to wage reductions exists not only among steel managements and labor, but in Government circles; it has cropped out in Congress in discussion of the railroad situation and the demand of the carriers for a 15 per cent cut in pay rates.

The steel industry is firmly of the opinion that price reductions at this time would not stimulate business, but, on the contrary, might, as has happened in the past, add to hesitation and uncertainty. It is perhaps equally true that stabilization of prices for the third quarter will not immediately improve the situation, as there are so many factors other than prices that tend to retard business recovery.

INGOT production has slipped this week in nearly all districts. Pittsburgh is an important exception, the rate there having gained three points to 29 per cent. In the Chicago area there has been a drop of four points to 29 per cent. The Wheeling-Weirton district, where operations have been fluctuating sharply, is down five points this week to 58 per cent; the Youngstown area has declined three points to 26 per cent. The Buffalo, Birmingham and St. Louis rates are off slightly, while production is unchanged in eastern Pennsylvania, Detroit and in southern Ohio. The rate for the entire industry is estimated at 30 per cent, down half a point from last week.

The South, which, except for the Wheeling-Weirton district, has had the highest operating rates in the industry during most of this year, is headed downward as the rail mill in that area approaches the end of its run on spring orders. The Tennessee Coal, Iron & Railroad Co. has blown out two blast furnaces, making a loss of five active furnaces in the Birmingham area within three weeks. Coke production and iron mining operations are likewise affected. The only active merchant blast furnace in eastern Pennsylvania will go out of blast next week.

The improvement at Pittsburgh while the rest of the industry is moving in a contrary direction is merely the result of a temporary accumulation of orders, a development that has occurred a number of times this year without being indicative of a trend.

STRUCTURAL steel lettings of only 4500 tons this week, the lowest for any week in more than two years, reflect at least a temporary lull in construction awards, which, though below normal, have been recently one of the most active branches of steel consumption. New structural steel projects out for bids total only 7000 tons, also a low amount, but jobs requiring plates total 7100 tons, of which 4570 tons is for tunnel linings for the Manhattan-Queens tunnel, New York. Reinforcing steel is fairly active, lettings having aggregated 5700 tons. The Chicago subway project, which shows progress, will take 35,000 tons of steel.

Although the RFC railroad loan bill, still pending in Congress, has been modified in ways that will place less restriction on the manner in which the money is to be spent, there is official doubt that the railroads will borrow more than \$100,000,000 out of the billion and a half dollars that is to be made available. Congressional opposition to the plan of the railroads for wage reductions may delay action on the bill and increase railroad opposition to dictatorial Government aid. Meanwhile, some work on cars has been planned. The Milwaukee Road will build 55 passenger cars and 464 flat cars in its own shops and the Missouri Pacific is to repair 300 box cars and build 100 new flat cars.

With automobile output tapering off in May, normally one of the best months for the industry, the outlook for the summer months is not promising.

AFTER a halting period, steel scrap has resumed its downward trend. At Chicago declines occurred in every item, the majority only 50c. but some as much as \$1. THE IRON AGE scrap composite price has dropped to \$11.42, lowest since July, 1935, and only \$1.09 below the 1935 minimum.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	May 17, 1938	May 10, 1938	Apr. 19, 1938	May 18, 1937
Rails, heavy, at mill	\$42.50	\$42.50	\$42.50	\$42.50
Light rails, Pittsburgh	43.00	43.00	43.00	43.00
Rerolling billets, Pittsburgh	37.00	37.00	37.00	37.00
Sheet bars, Pittsburgh	37.00	37.00	37.00	37.00
Slabs, Pittsburgh	37.00	37.00	37.00	37.00
Forging billets, Pittsburgh	43.00	43.00	43.00	43.00
Wire rods, Nos. 4 and 5, P'gh	47.00	47.00	47.00	47.00
	Cents	Cents	Cents	Cents
Sklp, grvd. steel, P'gh, lb.	2.10	2.10	2.10	2.10

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.45	2.45	2.45	2.45
Bars, Chicago	2.50	2.50	2.50	2.50
Bars, Cleveland	2.50	2.50	2.50	2.50
Bars, New York	2.81	2.81	2.81	2.78
Plates, Pittsburgh	2.25	2.25	2.25	2.25
Plates, Chicago	2.30	2.30	2.30	2.30
Plates, New York	2.55	2.55	2.55	2.53
Structural shapes, P'gh	2.25	2.25	2.25	2.25
Structural shapes, Chicago	2.30	2.30	2.30	2.30
Structural shapes, New York	2.52	2.52	2.52	2.5025
Cold-finished bars, P'gh	2.90	2.90	2.90	2.90
Hot-rolled strips, P'gh	2.40	2.40	2.40	2.40
Cold-rolled strips, P'gh	3.20	3.20	3.20	3.20
Hot-rolled annealed sheets, No. 24, Pittsburgh	3.15	3.15	3.15	3.15
Hot-rolled annealed sheets, No. 24, Gary	3.25	3.25	3.25	3.25
Sheets, galv., No. 24, P'gh	3.80	3.80	3.80	3.80
Sheets, galv., No. 24, Gary	3.90	3.90	3.90	3.90
Hot-rolled sheets, No. 10, Pittsburgh	2.40	2.40	2.40	2.40
Hot-rolled sheets, No. 10, Gary	2.50	2.50	2.50	2.50
Cold-rolled sheets, No. 20, Pittsburgh	3.45	3.45	3.45	3.55
Cold-rolled sheets, No. 20, Gary	3.55	3.55	3.55	3.65
Wire nails, Pittsburgh	2.75	2.75	2.75	2.75
Wire nails, Chicago dist. mill	2.80	2.80	2.80	2.80
Plain wire, Pittsburgh	2.90	2.90	2.90	2.90
Plain wire, Chicago dist. mill	2.95	2.95	2.95	2.95
Barbed wire, galv., P'gh	3.40	3.40	3.40	3.40
Barbed wire, galv., Chicago dist. mill	3.45	3.45	3.45	3.45
Tin plate, 100 lb. box, P'gh	\$5.35	\$5.35	\$5.35	\$5.35

Pig Iron

Per Gross Ton:	May 17, 1938	May 10, 1938	Apr. 19, 1938	May 18, 1937
No. 2 fdy., Philadelphia	\$25.84	\$25.84	\$25.84	\$25.76
No. 2, Valley furnace	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti	23.89	23.89	23.89	23.69
No. 2, Birmingham†	20.38	20.38	20.38	20.38
No. 2, foundry, Chicago*	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa.	25.34	25.34	25.34	25.26
Basic, Valley furnace	23.50	23.50	23.50	23.50
Malleable, Chicago*	24.00	24.00	24.00	24.00
Malleable, Valley	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago	30.34	30.34	30.34	30.04
Ferromanganese, seab'd carlots	102.50	102.50	102.50	102.50

†This quotation is subject to a deduction of 38c. a ton for phosphorus content of 0.70 per cent or higher.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	\$11.50	\$11.75	\$12.25	\$18.75
Heavy melting steel, Phila.	12.00	12.25	13.25	18.25
Heavy melting steel, Ch'go	10.75	11.25	11.25	16.75
Carwheels, Chicago	12.50	13.00	13.00	19.25
Carwheels, Philadelphia	14.75	14.75	15.75	21.25
No. 1 cast, Pittsburgh	13.75	14.25	14.25	19.25
No. 1 cast, Philadelphia	14.25	14.75	15.75	20.75
No. 1 cast, Ch'go (net ton)	10.75	10.75	10.75	15.25
No. 1 RR. wrot., Phila.	15.25	15.25	15.25	19.75
No. 1 RR. wrot., Ch'go (net)	8.25	8.75	8.75	15.25

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	\$4.00	\$4.00	\$4.00	\$4.60
Foundry coke, prompt	5.00	5.00	5.00	5.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn.	10.00	10.00	10.00	14.00
Lake copper, New York	10.125	10.125	10.125	14.12½
Tin (Straits), New York	26.375	38.00	39.00	55.25
Zinc, East St. Louis	4.00	4.00	4.25	6.75
Zinc, New York	4.39	4.39	4.64	7.10
Lead, St. Louis	4.35	4.35	4.35	5.85
Lead, New York	4.50	4.50	4.50	6.00
Antimony (Asiatic), N. Y.	14.75	14.75	15.75	14.50

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

Finished Steel

May 17, 1938
One week ago
One month ago
One year ago

2.605c. a Lb.
2.605c.
2.605c.
2.605c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

HIGH	LOW
2.605c., Mar. 9	2.330c., Mar. 2
2.330c., Dec. 28	2.084c., Mar. 10
2.130c., Oct. 1	2.124c., Jan. 8
2.199c., Apr. 24	2.008c., Jan. 2
2.015c., Oct. 3	1.867c., Apr. 18
1.977c., Oct. 4	1.926c., Feb. 2
2.037c., Jan. 13	1.945c., Feb. 29
2.273c., Jan. 7	2.018c., Dec. 9
2.317c., Apr. 2	2.273c., Oct. 29
2.286c., Dec. 11	2.217c., July 17
2.402c., Jan. 4	2.212c., Nov. 1

Pig Iron

\$23.25 a Gross Ton
23.25
23.25
23.25

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

HIGH	LOW
\$23.25, Mar. 9	\$20.25, Feb. 16
19.73, Nov. 24	18.73, Aug. 11
18.84, Nov. 5	17.83, May 14
17.90, May 1	16.90, Jan. 27
16.90, Dec. 5	13.56, Jan. 3
14.81, Jan. 5	13.56, Dec. 6
15.90, Jan. 6	14.79, Dec. 15
18.21, Jan. 7	15.90, Dec. 16
18.71, May 14	18.21, Dec. 17
18.59, Nov. 27	17.04, July 24
19.71, Jan. 4	17.54, Nov. 1

Steel Scrap

\$11.42 a Gross Ton
11.75
12.25
17.92

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

HIGH	LOW
\$14.00, Jan. 4	\$11.42, May 17
21.92, Mar. 30	12.92, Nov. 16
17.75, Dec. 21	12.67, June 9
13.42, Dec. 10	10.33, Apr. 22
13.00, Mar. 13	9.50, Sept. 25
12.25, Aug. 8	6.75, Jan. 3
8.50, Jan. 12	6.43, July 5
11.33, Jan. 6	8.50, Dec. 29
15.00, Feb. 18	11.25, Dec. 9
17.58, Jan. 29	14.03, Dec. 3
16.50, Dec. 31	13.08, July 2
15.25, Jan. 17	13.08, Nov. 22

...PITTSBURGH...

... District producer to reaffirm current prices for third quarter on leading hot-rolled items ... Many adjustments made on flat-rolled products.

PITTSBURGH, May 17.—A leading producer was expected this week to reaffirm present prices for third quarter delivery on major hot rolled items except flat rolled products on which a great number of adjustments are scheduled. The change in sheets, strip and tin mill black plate prices has been planned to bring various grades of these products into proper relation with each other and to eliminate inconsistencies brought about by overlapping. Similar revisions were also anticipated in cold rolled strip. Prices on wire products will be unchanged from present quotations.

Ingot output in the Pittsburgh district has risen three points to 29 per cent of capacity owing to an accumulation of orders. The Wheeling-Weirton district has dropped five points to 58 per cent of capacity.

New steel business in the past week was in greater volume than a week ago, but this spurt is similar to those which have occurred periodically since the early part of February. Orders so far this month are a shade better than in the corresponding period in April for most companies in this district.

No. 1 heavy melting steel is slightly softer this week, being off 25c. a ton from last week's quotation.

Pig Iron

Orders continue to dribble in with very little change in total tonnage placed from week to week. Demand is at a low point, with little interest being shown in prices.

Semi-Finished Steel

Present quotations were to be reaffirmed for the third quarter. Meanwhile, demand is still moving sideways with weekly tonnages reflecting spot purchases by non-integrated mills.

Bars, Plates and Shapes

Demand continues sluggish but total volume is no less than a week

ago. Structural plate and shape prices were reaffirmed. Meanwhile, structural specifications are holding their own and tonnages booked during the past week were about in the same volume as the previous week.

Reinforcing Bars

New business is unimpressive while awards during the past week involved projects of less than 500 tons. The current quotations were expected to be reaffirmed for third quarter delivery.

Wire

Present prices on wire products were renamed for third quarter delivery. Meanwhile, a further receding in merchant wire specifications has been partially offset by slight increases in manufacturers' wire bookings. Total business, however, is in less volume than a month ago.

Tin Plate

Tin plate operations over the next 60 days will depend somewhat on weather conditions. Meanwhile, operations are estimated at 50 to 55 per cent. New business is in about the same volume as a week ago.

Sheets and Strip

Third quarter quotations on various grades of sheets, strip and tin mill black have been announced by the leading producer and reflect an entirely new setup in the flat rolled price structure. The net return will be practically unchanged from current prices.

Tubular Goods

Total tubular sales volume has been more or less static for the past few weeks. The recession in oil-country goods specifications has been stopped temporarily at least. Bethlehem Steel Co. is now supplying seamless oil-country casing and line pipe and will maintain a mill depot at Houston, Tex. Pipe will be manufactured at the

Babcock & Wilcox Tube Co. plant at Beaver Falls, Pa., where stocks will also be maintained.

....BUFFALO....

Ingot output slightly lower.

BUFFALO, May 17.—Operations show a slight decrease with 11 open hearths active. Republic Steel Corp. has cut from two to one, while Bethlehem's Lackawanna plant continues to operate nine and Wickwire-Spencer, one.

Pig iron makers report inquiries somewhat more scattered, but limited to small lots.

Low bidder for the Pieri warehouse, Buffalo, involving 110 tons of structural is Joseph Lureachia, Buffalo.

The Buffalo Cancer Hospital job, being rebid May 19 for the second time, calls for 500 tons of structural: 105 tons of bars and 110 tons of sheet piling.

Cuba, N. Y., centralized school job low bidder is L. C. Whitford, Wells-ville, N. Y. This job will require 350 tons of structural steel.

Bidding this week is for the Rushville, N. Y., school job requiring 200 tons of structural steel.

RAILROAD BUYING

Milwaukee Road will build 65 passenger cars and 464 flat cars in its own shops.

J. G. Brill Co. has received an order from Columbus & Southern Ohio Electric Co., Columbus, Ohio, for 40 additional Brill 44-passenger single-motor trolley coaches.

Edward G. Budd Mfg. Co. has received an order for 50 light-weight stainless steel motor freight semi-trailers from Horton Motor Lines, Inc.

RFC has made a commitment, subject to approval of the Interstate Commerce Commission, to purchase from receivers of the Seaboard Airline Railway \$2,116,061 4 per cent equipment trust certificates to finance approximately 90 per cent of the cost of nine 1800-hp. diesel electric locomotives, six passenger coaches, and four mail express cars.

Missouri Pacific will make repairs to 300 50-ton box cars at its shops in DeSoto, Mo., followed by the building of 100 new flat cars, requiring 1000 tons of steel parts, to be fabricated by American Car & Foundry Co. at its Madison, Ill., plant.

RAILS AND TRACK SUPPLIES

The Erie has indicated that it will require an additional tonnage of rails above the 10,967 tons allocated May 7.

Cleveland Railway Co., Cleveland, has received bids on 600 tons of rails, 400 to 500 tons of girder rails, and accessories.

... CHICAGO ...

*... District ingot output down four points to 29% ...
Chicago subway to take 35,000 tons of steel ... Good
crop movement expected to produce some railroad
buying.*

CHICAGO, May 17.—A four point loss in operations was brought about this week by declines at three district mills. The Chicago area is now producing steel at 29 per cent of capacity.

It finally appears that definite progress is being made on the Chicago subway and that funds for construction are to be available. The most accurate available estimate is that some 35,000 tons of steel of various types will be necessary for this project, which can be started within 60 days, according to city officials, if necessary funds are assured.

Some hopes are being held out for railroad buying over the summer, especially in this territory. The second best crops in 15 years are expected to bolster the revenues of many of the Western roads to the extent that some of their much-needed replacements and repairs can be afforded. Grain shipments have increased 15.2 per cent over 1937, the only one of eight major commodities to make an advance. Little prospect for immediate improvement in movement of manufactured goods is seen.

Good crops are causing predictions of another big year for the farm equipment makers. A 3 per cent rise in income from marketings during the first quarter is reported from the states west and southwest of Chicago. Sales of combines and haying equipment are expected to benefit especially.

It is believed here that railroad reaction to RFC loans will be mixed. One official predicts several car inquiries within a few weeks on the strength of the possibility of these loans, but emphasizes that the inquiries will be meaningless as far as immediate business is concerned and may never eventuate.

Scrap prices are lower this week, No. 1 steel being quoted at \$10.50 to \$11.00, down 50c.

Pig Iron

Even though operations are still at a low rate, inventories are constantly being reduced, and the trade feels that

a general buying movement may be under way by fall. Conditions are spotty, with some foundries extremely busy and other barely able to pour once a week. With the lessening of activity in plants of farm implement makers, shops making such castings are slowing down also.

Structural Shapes and Reinforcing Bars

The prospective Chicago subway construction plan is the largest project to loom on this horizon for many months. Preliminary estimates indi-

cate that about 7000 tons of reinforcing steel, 13,000 tons of structural, 4200 tons of liner plates, 8800 tons of sheet piling and 1000 tons of miscellaneous steel will be required, if the necessary funds are provided.

Wire and Wire Products

Announcement of fall terms is expected to spur on the sales of merchant products to the farm, buyers whose activity is now beginning to slacken slightly. No noticeable improvement is seen in industrial demand for wire. The price structure is firm, except for nails.

Sheets, Strip, Bars and Plates

Automobile buying of sheets, strip and bars is no better and no great improvement is forecast until autumn. Bids are being taken May 24 on 400 tons of 26-gage sheets for Wisconsin license plates. Fewer specifications are being received from the farm equipment industry. Until the railroads are able to buy normally once more plate mills will not be busy.

CANADA

... Further large orders for munitions expected in the Dominion.

TORONTO, Ont.—Following announcement of contracts for machine guns to the John Inglis Co., Toronto, amounting to approximately \$5,000,000, it is reported that an additional outlay in the neighborhood of \$3,000,000 will be necessary for equipment and special machinery. Prospective contracts for guns, munitions, armament and general war supplies to be placed in Canada are estimated at upward of \$100,000,000. Already a number of other contracts have been awarded, but officials have not announced the items or values of the new contracts.

General outlook for the Canadian iron and steel industry is very favorable. Steel interests look for even greater production records than those achieved last year. Railroad awards for rolling stock this year have reached a total of \$25,000,000 and rolling stock plants are now running full time with heavy deliveries to be made next month. Western Canada is looking forward to big crops for the year and already these predictions are tending

to stimulate implement sales. The automotive industry is operating on schedules below those of a year ago, but improvement is reported in new car sales recently. Domestic demand for steel is holding at a steady level with most sales in small lots. Sheets and bars are moving freely with mills covered with sheet contracts to the end of this quarter. Building trades report improvement and demand for structural steel is picking up steadily. Prices in all materials are steady and unchanged.

Merchant pig iron sales, while practically unchanged for the week, totaling around 2000 tons, show indications of favorable increase at an early date. Inquiries again are appearing in the market and it is stated that some melters covered by contract for this quarter have been adding to deliveries by further spot orders. Smaller melters, however, continue to take iron as demands dictate but are in the market at frequent intervals. Production of iron continues steady with five stacks blowing.

Some improvement is reported in the scrap markets, but dealers continue to report specialized demand. Melters chiefly are interested in machinery cast and heavy melting steel and dealers are experiencing some difficulty in filling all orders for these materials.

..BIRMINGHAM..

Two blast furnaces blown out, making total of five in three weeks.

BIRMINGHAM, May 17.—Pig iron production was curtailed further last week, when the Tennessee Coal, Iron & Railroad Co. blew out two furnaces, Ensley No. 1 and Ensley No. 3, on Friday, May 13. There are now seven active stacks, a loss of five in the last three weeks. Tennessee Coal, Iron & Railroad Co. is operating four, and Woodward Iron Co., Sloss-Sheffield Steel & Iron Co. and Republic Steel Corp., one each. Pig iron buying and shipments continue light. The market is mostly on a spot basis.

Twelve open hearths continue in operation. Tennessee Coal, Iron & Railroad Co. has taken off one at Fairfield, but the Republic Steel Corp. has added another at Gadsden. The active total now consists of five at Fairfield, three at Ensley and four at Gadsden.

Steel buying is now routine and rather limited. New bookings are in small lots.

With the blowing out of the two Ensley furnaces, the Tennessee company also closed down two batteries of coke ovens. This will also affect mining operations.

..GREAT BRITAIN..

...Less confident view of future prevails... Scrap cartel to make no new purchases now.

LONDON, May 17 (By Cable).—Pig iron import duties were restored May 13, making duties on non-Empire pig iron 33 1/3 per cent, but excluding pig iron smelted wholly with charcoal and vanadium titanium pig iron or cobalt pig iron which continue free.

The market is still dull with export demand idle. Consumers expect lower prices after June, but it is significant that the Government expressed satisfaction that present prices are reasonable. There were 111 blast furnaces active at the end of April, representing a decrease of 22 furnaces this year. Steel output during April was the lowest since August, 1936. A less

confident view is now prevalent. Makers of semi-finished steel, sheets, light sections want work badly. Makers of heavy steel are still busy but able to give much quicker delivery on new business.

Manchuria and Japan bought some Continental steel, but conditions are generally still quiet, and the opinion is expressed that buyers are holding off pending the decision on the renewal of the Raw Steel Cartel, which is expected shortly. There will be a full meeting of the cartel at Rome on May 24. Rail and tin plate cartels are expected to meet at Rome about the same date.

Recent Paris meeting of the International Scrap Cartel decided to make no further purchases for the time being.

The tin plate market is quiet with output about 40 per cent. Galvanized sheets are idle. Indian price now £18, 15s. c.i.f.

Total imports during April amounted to 61,500 tons, of which 3100 tons came from the United States. Exports of pig iron amounted to 5500 tons, of which 40 tons went to the United States. Total iron and steel exports amounted to 168,000 tons.

...BOSTON...

Pig iron sales are slightly improved.

BOSTON, May 17.—Furnace representatives generally report pig iron shipments and orders as better, but add they are nothing to get enthusiastic about. With them a 150-ton order is still a large order, most business booked being in carlots, and when such orders aggregate five or six a week, the comparable showing is encouraging. Sales the past week were about double those of the preceding week, having been around 1200 tons. Several foundries have found it necessary to replenish stocks.

Business in fabricated steel and reinforcing steel has slowed noticeably. There are several round tonnages hanging over the market, bids for which have been submitted. But since it has become certain the Government will shortly start a big spending program, cities and states are hoping to obtain Government funds for projects under consideration, which in a large measure accounts for holding back lettings.

..CAST IRON PIPE..

Auburn, Mass., has appropriated \$50,000 for a water system on Packachoag Hill. Andrew Love is chairman of the committee.

Rock Island, Ill., plans pipe line extensions in main water system, including 36-in. to cost about \$69,000, 20-in. to cost close to \$150,000, and 12-in. to cost about \$12,000. Entire project with reservoir and other waterworks installation will cost over \$500,000. Federal Engineering Co., Davenport, Iowa, is consulting engineer.

Montgomery, Ala., plans pipe line extensions and improvements in water system. Cost about \$394,000 with other waterworks installation. Financing will be arranged through Federal aid.

Kensington, Minn., plans 4, 6 and 8-in. pipe for water system; also new pumping station and auxiliary waterworks installation. Cost about \$27,000. Financing will be arranged through Federal aid. Ealy G. Briggs, 1951 University Avenue, St. Paul, Minn., is consulting engineer.

Brighton, Mich., plans pipe lines for water system and other waterworks installation. Cost about \$40,000. A bond issue has been authorized. Ayres, Lewis, Norris & May, Ann Arbor, Mich., are consulting engineers.

Bellefontaine, Ohio, has awarded 100 tons of cast iron water pipe to James B. Clow & Sons Co., Cleveland.

Sandusky, Ohio, will take bids soon on a water intake project involving about 9000 ft. of 24-in. and 9000 ft. of 20-in. pipe.

Green Bay, Wis., has placed 27,602 lin. ft. of 6-in. water pipe, 19,030 ft. of 8-in., and 5690 ft. of 10-in. with James B. Clow & Sons Co., Chicago.

Oketo, Kan., plans pipe lines for water system, 25,000-gal. elevated steel tank and tower, and other waterworks installation. Financing is being arranged through bond issue and Federal aid. Paulette & Wilson, 1006 Kansas Avenue, Topeka, Kan., and Farmers' Union Building, Salina, Kan., are consulting engineers.

Chesapeake City, Md., asks bids until May 24 for pipe for water system and other waterworks installation. Cost about \$39,500. J. B. McCrary Engineering Corp., Marietta Building, Atlanta, Ga., is consulting engineer.

Tempe, Okla., plans pipe line extensions in water system. Cost about \$20,000.

Sioux City, Iowa, has awarded contract to United States Pipe & Foundry Co. for cast iron pipe for water department at \$11,727.

Sugar Creek, Ohio, has plans for pipe lines for water system and other waterworks installation. Fund of \$123,000 has been arranged through Federal aid.

Poteau, Okla., plans pipe line extensions in water system. Cost about \$18,000.

Jeffersonville, Ohio, plans pipe lines for water system and other waterworks installation. Fund of \$70,000 has been arranged.

Akron, Ohio, plans new trunk main for water system in several streets in southwestern part of city. Cost about \$135,000. Financing is being arranged through Federal aid.

Burbank, Cal., has awarded 190 tons of 6, 8 and 20-in. pipe, class 250, to United States Pipe & Foundry Co., San Francisco.

United States Treasury Procurement Office has awarded 188 tons of 8-in. pipe, for delivery at Oakland, Cal., to United States Pipe & Foundry Co., San Francisco.

... CLEVELAND ...

... Important revision of sheet and strip classifications expected ... Other base prices are reaffirmed ... Fabricated steel projects principal market activity.

CLEVELAND, May 17.—The attention of the trade was centered upon the third quarter price announcement, and particularly upon the often-discussed revision in flat rolled classifications and extras to be announced by producers as a step toward clarity.

New business continues light with very little change in aggregate weekly volume from the last report. Alloy grades are lagging, due to lack of automotive buying.

Ingot output is unchanged this week in the Cleveland-Lorain district at 18 per cent, and down three points to 26 per cent in the Valleys district, composed of Youngstown and nearby cities.

Cleveland Railway Co. has taken bids on 600 tons of standard rail and 400 to 500 tons of girder rails and accessories. Erie Railroad indicates it will require an additional tonnage of standard rails above the 10,967 tons allocated May 7.

The City of Cleveland will take bids May 20 on about 1100 tons of steel pipe for the Brook Park Road extension from Parma Reservoir. Sandusky, Ohio, plans to take bids soon on approximately 1570 tons of cast iron water pipe. Two standpipes at Akron will require around 600 tons of plates, bids having been taken last week and today (Tuesday). Akron also is active on two sewer projects involving 400 tons of reinforcing bars and 100 tons of piling.

Pig Iron

Orders and shipments remain light. Many foundrymen, assembled here this week for their annual convention, report their inventories are low, but they see no necessity for buying right now except to cover actual current requirements. This is particularly true in the Middle West, and to a lesser extent in the South. There has been very little discussion of iron prices for third quarter here. With the great spread now existing between scrap and pig iron, a reduction of even as much as \$3 or \$4 a ton in iron would mean little right now.

Sheets and Strip

Interest centers upon the expected revisions in flat rolled classifications which have long been awaited. Confronted with the necessity for ironing out inequalities and alining extras, producers have for some time been attempting to design a constructive program. Current demand for sheets and strip shows very little change from the last report. Miscellaneous carload orders are fairly well maintained, but automobile business remains absent.

Wire and Wire Products

Demand continues very dull in the Middle West and slightly stronger in the South, Southwest and New England districts. While there has been some slight improvement in manufacturers' wire recently, the orders were hardly sufficient to cause much of a

change in the aggregate volume. Lack of bolt, nut and rivet business has kept rod sales at a low level.

Bars, Shapes and Plates

Several new fabricated steel projects have come up in this area recently, including 200 tons for a Springfield, Ohio, Y.M.C.A. building, 200 tons for the Toledo Coca-Cola bottling works, and 400 tons for a Link-Belt Co. building at Indianapolis. Pittsburgh-Des Moines Steel Co. was low bidder May 10 on an Akron standpipe involving 300 tons of plates, while bids on a second Akron standpipe requiring around 300 tons close today (Tuesday). Akron sewer work, which includes around 400 tons of reinforcing bars and 100 tons of piling, is to be let this week.

Iron Ore

Lake Superior iron ore shipments from upper Lake ports totaled 260,514 gross tons in April compared with 3,770,555 tons in April, 1937. The dock balance at lower Lake ports May 1 was 5,395,509 tons compared with 5,487,221 tons on April 1 and 2,336,653 tons May 1, 1937.

....PIPE LINES....

Quartermaster Supply Officer, Army Base. Fifty-eighth Street and First Avenue, Brooklyn, closes bids May 20 for welded steel pipe, pipe fittings, valves, etc., comprising 178 items in all (Circular 626-244).

Michigan-Toledo Pipe Line Co., Mount Pleasant, Mich., and Toledo, Ohio, a subsidiary of Standard Oil Co. of Ohio, Cleveland, is considering new welded steel pipe line from oil field district in Arenac County, Mich., to point on Saginaw Bay at Bay City, Mich., for crude oil transmission to new bulk terminal plant to be built at last noted place. Proposed line will replace recently projected welded steel pipe line from same oil field to point on Lake Huron, near Whitestone, Mich., which has been abandoned.

Corpus Christi, Tex., plans extensions and improvements in pipe lines for municipal gas distribution, including replacements in different parts of system. Cost about \$25,000. Work is scheduled to begin in June.

Water Department, Toledo, Ohio, plans steel pipe lines for main water system from new source on Lake Erie. Project is estimated to cost about \$7,650,000, including waterworks stations and distribution lines in city. Financing will be arranged through Federal aid. George N. Schoonmaker is chief engineer of department.

New Haven Gas Light Co., Crown Street, New Haven, Conn., has approved plans for extensions and replacements in pipe lines, including expansion and improvements in gas plant. Work will be carried out by company forces. Cost close to \$125,000.

Metropolitan Utilities District, Eighteenth and Harney Streets, Omaha, Neb., T. R. Leisen, secretary, plans pipe lines for gas distribution in recently established District No. 841.

Socony-Vacuum Oil Co., 903 West Grand Boulevard, Detroit, has authorized installation of 8-in. steel pipe line from Lakeside waterfront at Muskegon, Mich., to bulk storage plant in same city, duplicating an existing pipe line, for gasoline transmission, unloaded from transports at company wharf at Detroit.

Petroleum Producers' Association, Edmonton, Alta., plans new welded steel pipe line from Turner Valley oil field, Alberta, to Fort William, Ont., and vicinity, about 1200 miles, for oil transmission. Cost over \$10,000,000 with booster stations and other operating facilities.

Cleveland will take bids May 20 on 12,000 ft. of 36-in. steel pipe for a further extension of lines from Parma Reservoir, also bids on 8000 ft. of 30-in. steel pipe with an alternate of concrete pipe on this item.

Lewiston, Mont., has awarded 30,500 ft. of seamless bitumastic pipe to Crane Co., San Francisco.

SWOC, Ahead in Most NLRB Elections, Is Loser in 16

RESULTS of Labor Board elections last year in plants of three steel companies were one sided enough to keep the SWOC far ahead to date in its latest compilation of Labor Board balloting involving 73 companies.

The SWOC has lost 16 elections and won 57, it reports, with 45,609 workers voting for the SWOC and 22,177 voting against it.

Cheered by recent election results at American Rolling Mill Co. and Interlake Iron Corp. plants, where the SWOC was defeated, critics of the Lewis organization point out that most of the union's lead in its vote totals was built up in elections held prior to last summer's unsuccessful strikes in plants of several large steel companies. With the union's popularity at a peak early last spring, the Labor Board's elections gave the SWOC a margin of more than 15,000 in plants of Jones & Laughlin Steel Corp., Pittsburgh Steel Co., and Sharon Steel Corp.

Where Lewis Lost

Here are the 16 companies owning plants in which, according to the SWOC's own record, a majority of the employees have rejected the Lewis union as their collective bargaining agent:

	Against SWOC	For SWOC
American Rolling Mill Co. (Butler plant)	1243	402
Interlake Iron Corp.	343	252
Duff-Norton Mfg. Co.	95	88
Combustion Engineering Co.	119	89
National Malleable & Steel Casting Co.	456	316
National Supply Co. of Delaware	366	322
Pacific States Cast Iron Pipe Co.	235	136
Rheem Mfg. Co.	102	69
U. S. Air Compressor Co. ...	58	35
Wilson Steel & Wire Co.	137	75
Trojan Steel Co.	32	17
Thomas L. Green & Co.	23	14
Frank Prox Co.	33	22
Parsons Casket Hardware Co.	64	33
Confer Smith & Co., Inc.	32	29
Bradley Washfountain Co. ...	30	20

A much longer list, including a few recent elections but carrying many vote results compiled before the Lewis' union movement received its setback early last summer in strikes the union called at Canton, Chicago, Cleveland, Youngstown, Bethlehem

and elsewhere, shows that the J. & L. election still is the biggest SWOC victory in mill elections held under the friendly auspices of the National Labor Relations Board. The J. & L. workers voted 17,028 for and 7207 against the SWOC. Recent plant

U. S. Steel to Spend \$80,000,000 This Year

WASHINGTON.—United States Steel Corp.'s registration statement filed with the SEC, covering \$100,000,000 of 10-year debentures, said that uncompleted work expected to be finished this year calls for additional expenditures of approximately \$80,000,000, listed as follows:

\$46,500,000—Completion of new hot strip mill and cold reduction sheet and tin mills near Clairton, Pa., known as Irvin Works, and new slabbing mill at Edgar Thomson Works at Bessemer, Pa.

\$5,805,000—Completion of blooming and slabbing mill and new facilities for cold reduced tin plate in Birmingham district.

\$3,685,000—Completion of new facilities at Cuyahoga Works near Cleveland for manufacture of cold rolled strip.

\$2,125,000—Completion of modernization of cement plants at Hudson, N. Y., Independence, Mo., and Leeds, Ala.

\$1,575,000—Completion of four new ore-carrying steamships for use on the Great Lakes.

\$20,310,000—Miscellaneous capital expenditures on various plants and facilities at various locations.

Approximately \$45,000,000, out of such unexpended authorization of \$80,000,000 at Dec. 31, 1937, will have been expended up to June 1, 1938. It is contemplated that most of such uncompleted work will be completed by the end of 1938.

1937 Light Steel Output Established New Record

OUTPUT of light steel products (sheets, strip, black plate for tinning, wire rods, etc.) which go into consumers goods, last year broke all records at 16,864,000 gross tons, compared with 15,995,000 tons in 1936 and 13,640,000 tons in 1935, the American Iron and Steel Institute reports.

Reflecting rising importance of consumer's goods, such as automobiles,

elections to which the SWOC calls the attention of its followers are:

	For SWOC	Against SWOC
International Harvester Co. .	3255	1821
Northwestern Barb Wire Co. .	687	482
Wickwire-Spencer Steel Co. .	412	354

Two close elections reported by the SWOC national headquarters at Pittsburgh are: Acme Steel Co., for SWOC, 1113, against, 877; American Car & Foundry Co. (Berwick, Pa., plant), for SWOC, 1164, against, 920.

refrigerators, farm equipment, the proportion of total steel output represented by light products has more than doubled in the past 30 years and has increased 50 per cent since 1929. In 1907, light products amounted to 22 per cent of total steel production; 1929, 33 per cent; 1937, 46 per cent.

10,000 Attend Opening of Foundry Convention

THE 42nd annual convention of the American Foundrymen's Association, being currently held in Cleveland, got off to an auspicious start on the opening day, May 16, when 10,000 visitors jammed the halls of the auditorium to view the large display of foundry equipment and supplies set up in the auditorium. Employees of local foundries constituted a large portion of this attendance.

Private Annuity Program Planned by Westinghouse

WESTINGHOUSE Electric & Mfg. Co., East Pittsburgh, is considering a plan to supplement Federal social security with a private annuity program as soon as the government project has been stabilized, according to W. G. Marshall, vice-president in charge of industrial relations.

Trackwork Shipments Drop Again In April

SHIPMENTS of trackwork for tee rail track of 60 lb. per yard or heavier in April was 3793 net tons compared with 4461 tons in March and 9888 in April, 1937. (Shipments of one company are not included in the figures for March and April of 1938.)

.. PHILADELPHIA ..

*... Eastern Pennsylvania operations hold at 26 per cent
... Some ship plate released ... Consumers awaiting
price announcements ... Scrap undertone continues
weak.*

PHILADELPHIA, May 17.—Eastern Pennsylvania steel production for the third week is unaltered at approximately 26 per cent of capacity, the district as usual running a few points under the national rate. The market here is almost devoid of news, significant or otherwise, with sellers on the whole holding to the opinion that current inactivity matches anything in the '32 depression. A little miscellaneous tonnage drifting in each week; some ship plate commitments to three local mills from Sun, final rollings on some export orders, and a little structural tonnage from other districts, all go to make up rolling schedules about equal in volume to the April average. Although the past fortnight has shown indications that some outlets, as for instance warehouses, have worked down stock piles materially, there is little likelihood of replacement buying until leading mills announce third quarter price schedules.

It is known that fabricated shapes and bars are hitting low levels, nail prices are very disorganized, and plates and sheets have moved under some very odd "ultimate destination" provisions. However, at the same time, the bulk of the district's tonnage continues to be booked at published quotations.

Pig iron is like finished steel in that those consumers in the position to take on tonnage are prone to await price announcements. In any case, no furnace expects much buying for several months, as foundries here are operating on skeleton schedules with little new business in prospect. The district's only active merchant stack will be blown out next week.

Scrap, with no domestic demand and a cessation of foreign inquiry, continues to ease off slightly, although it is apparent from the looks of yards that there is no distress material to speak of in this area, which leads to an expectation of a volatile price situation once the operating rates start to move upward.

Construction demands are at low ebb, the week's sole shapes disposition involving 225 tons for a Washington

warehouse, awarded to Fort Pitt Bridge Works, the reinforcing steel market at same time being momentarily enlivened by a 1700-ton award to Bethlehem for the same job. The bid date for the Washington Printing Office, involving 8000 tons of shapes, has been moved ahead to May 27, and other projects pending are 1000 tons for a du Pont building at Baton Rouge, La., on which bids are due this week; a Clark Street bridge, Jersey City, N. J., calling for 118 tons of shapes, to be bid June 1, and a Laurel, Pa., hospital, requiring 100 tons of bars, which will be bid soon.

Imports

The following iron and steel imports were received here during the past week: 3500 tons of chrome ore from South Africa; 250 tons of ferromanganese from Czechoslovakia; 66 tons of steel tubes, 2 tons of steel forgings and 43 tons of steel bars from Sweden.

.. SAN FRANCISCO ..

*Seattle Port closed by strike
... Few jobs awarded.*

SAN FRANCISCO, May 16.—The Seattle port tie-up overshadowed the week's steel activity, as no large awards or inquiries appeared.

Closing of the port of Seattle by a maritime strike in sympathy with the Tacoma, Wash., maritime lockout completed the stagnation of water traffic in the State of Washington. In San Francisco, the Committee of 43, a newly-formed employers' organization, called a meeting of representatives of all business and civic groups as the first step in a drive to rid the city of radical unionism. A more settled labor outlook on the Coast would undoubtedly lend great impetus to plant building and the steel business as a whole.

Flood control work in the Los Angeles area by the United States Engineer accounted for a 900-ton sheet

piling proposal; closing date is May 20.

Steel Tank & Pipe Co., Berkeley, Calif., was low bidder on approximately 750 tons of welded, cement-lined steel pipe for the East Bay Municipal Utility District, Oakland, Calif. No other large plate inquiries are in sight until bids are called on completion of the Metropolitan Water District's Los Angeles aqueduct and the penstocks for Shasta Dam. Neither is expected in the immediate future. Rumors that the Pacific Gas & Electric Co. contemplates a large new Central Valley, Calif., pipe line seem to have no tangible basis.

Both public and private projects continue to support the reinforcing bar market. The award of 350 tons for the I. Magnin Co., Los Angeles, store to the Ceco Steel Products Co., Los Angeles, was the largest of the week; 1400 tons of shapes for this building were awarded to Columbia Steel Co. about six weeks ago.

.... ST. LOUIS

*... Missouri Pacific to repair
300 cars at own shops.*

ST. LOUIS, May 17.—The Missouri Pacific Railway, DeSoto, Mo., will shortly make repairs to 300 box cars at its shops. This will be followed by the construction, beginning in August, of 100 new flat cars, which will require 1000 tons of steel parts to be fabricated by the American Car & Foundry Co. at its Madison, Ill., plant.

Gates for the dam at Fort Peck, Mo., will require 300 tons of structural shapes, and bids are due today for a Government hospital at Murfreesboro, Tenn., involving 600 tons of reinforcing bars. Buying of finished steel is extremely quiet.

Reports from the agricultural implement sector are of further curtailment of production, and it is estimated that the melt of pig iron there is about 25 per cent of what it was last fall. Two of the larger plants have closed down for inventory and repairs, and other plants will go down some time between June 15 and July 1. A slight pickup is reported from the stove foundries, which are operating four or five days a week on fall orders. Jobbing foundries here are working an average of three days a week.

Ingot operations are at 32 per cent of capacity.

...NEW YORK...

... Manhattan approach to East River tunnel will take 4570 tons of steel liners ... Jobbers stabilize galvanized sheets at 4.75c. a lb.

NEW YORK, May 17.—There has been no marked change in the volume of steel business in this territory. There has been some activity among the tank builders and shipyards, and there are several sizable projects on which action yet has to be taken. Bids for the city scow job may be readvertised, although the decision to go ahead has not yet been given. Woodcrest & Rosoff Brothers Co. is low bidder on steel liners (4570 tons) for the Manhattan approach to the Queens tunnel under the East River. A patented construction is to be employed. Alternate bids with cast iron rings were all higher. Some plates are also involved in extensions of approach to the George Washington Bridge.

The volume of sheet orders has shown a slight improvement, including better ordering from the jobbers. The

retail market, badly weakened by a flood of seconds, is beginning to show signs of strength. Galvanized sheets in recent weeks have been selling anywhere from 4.35c. to 5.00c. per lb. Last Friday, however, the leading warehouses established a price of 4.75c.

Pig Iron

An occasional carload is about the only extent of ordering from local foundries, and no material betterment is looked for until general business picks up. Most sellers are in Cleveland this week attending the Foundrymen's convention. Foreign business is showing an upturn, with inquiries running up to 1000 tons. Some of the sources are doubtful, however, including some inquiries from Chinese buying houses. A few sales have been made to countries of northern Europe.

REINFORCING STEEL

... Awards of 5730 tons; 3525 tons in new projects.

AWARDS

- 1700 Tons, Washington, warehouse, to Bethlehem Steel Co., Bethlehem, Pa.
- 450 Tons, Lansing, Mich., Board of Light and Water Department, to Jarvis Engineering Co., Lansing.
- 435 Tons, New York, Queens-Midtown tunnel, contract No. 7, to Bethlehem Steel Co., Bethlehem, Pa.
- 370 Tons, Westport-Fairfield, Conn., seven State bridges, to Truscon Steel Co. and Concrete Steel Co., New York.
- 350 Tons, Los Angeles, I. Magnin Co. store, to Ceco Steel Products Co., Los Angeles.
- 300 Tons, Chicago, Coca-Cola building, to Bethlehem Steel Co., Bethlehem, Pa.
- 300 Tons, Detroit, hospital, Sisters of Mercy, to Pollak Steel Co., Cincinnati.
- 300 Tons, Ann Arbor, Mich., hospital, to Joseph T. Ryerson & Son, Inc., Chicago.
- 285 Tons, Baltimore, Army engineers, to Bethlehem Steel Co., Bethlehem, Pa.

- 250 Tons, Akron, Ohio, sewers, to West Virginia Rail Co., Huntington, W. Va.
- 200 Tons, San Francisco, Marin-Dell creamery, to Gilmore Steel Co., San Francisco.
- 190 Tons, New York, Ford Motor Co. building for World's Fair, to Bethlehem Steel Co., Bethlehem, Pa.
- 178 Tons, Parco, Wyo., Kendrick project, to Colorado Fuel & Iron Co., Denver.
- 120 Tons, Baltimore, Back River sewage disposal blower house, to Bethlehem Steel Co., Bethlehem, Pa.
- 100 Tons, Phoenix, Ariz., Salt River project to Colorado Fuel & Iron Co., Denver.
- 100 Tons, Green Bay, Wis., pumping station, to W. H. Pipkorn, Minneapolis.
- 100 Tons, Boston, to Northern Steel Co., Truscon Steel Co., and Charles J. McCarthy Co., Boston.

NEW REINFORCING BAR PROJECTS

- 1000 Tons, Washington, printing office annex.
- 600 Tons, Murfreesboro, Tenn., Government hospital; bids due May 17.
- 441 Tons, Pullman, Wash., bridges; bids May 24.
- 360 Tons, Newtown, Conn., Fairfield Hospital; bids this week.

260 Tons, Akron, Ohio, Market Street storm sewer; Marra & Sons, low bidder.

200 Tons, Calexico, Calif., All-American Canal; bids opened.

162 Tons, Odair, Wash., Grand Coulee Dam; bids opened.

150 Tons, Akron, Ohio, Wilbert Road and Kentucky Avenue storm sewer; bids in.

130 Tons, Valley Springs, Calif., two bridges; bids June 1.

124 Tons, Oakland, Calif., Glen View School; E. T. Leiter & Sons, general contractor.

100 Tons, Laurel, Md., hospital; bids soon.

...CINCINNATI...

Galvanized sheets in fairly good demand.

CINCINNATI, May 17.—Galvanized sheets are holding the chief interest of consumers, and district mills are operating in these units at about 55 per cent of capacity, while the average of all sheet units is about 30 per cent. Refrigeration, stove and automobile demand is definitely off, although inquiries for die work from the motor car field are reported.

Production of ingot steel is at the same level as last week, 13 out of 34 open hearths being in operation. One interest with three out of eight furnaces in production indicates that this rate will hold only five days this week.

The pig iron market is dull and featureless. Scattered small tonnage orders constitute the general demand, while shipments on contract remain at the April level. Furnace representatives report prices on both northern and southern iron to be firm.

Sitdown "Illegal," NLRB Attorney Tells Court

CHICAGO.—In what is believed to be the first such public admission by the labor board, a NLRB lawyer Monday declared sitdown strikes to be "foolish and illegal." The statement was made in appeal proceedings before the circuit court here of the Fansteel Metallurgical Corp., which has been ordered by the board to reinstate 93 employees participating in the sitdown strike at the company's plant over a year ago. The board's lawyer, however, still insisted that the men be reinstated and the original board order upheld.

...NON-FERROUS...

... Copper quiet as stocks rise 12,900 tons ... Prime Western sales total 2750 tons, mostly at a 4c. price level ... Consumer disinterest forces tin price down ... Lead quiet at 4.35c.

NEW YORK, May 17.—With copper fabricators operating at only about one-third their capacity, interest in new commitments of the refined red metal is naturally at low ebb. Except in a few isolated cases, consumer inventories are well able to take care of needs for some time to come. The week's buying activity was confined mostly to transac-

tions between producers and their fabricating subsidiaries, although foreign interest is still a material factor in this market, the price for export today being 9.50c. c.i.f. Domestic copper statistics, which came out late last week, were about as was expected, with refined stocks going up in April 12,900 tons and deliveries off 1700 tons, as compared to the March ship-

ments. Exports, at 11,200 tons in April, constituted a new high in monthly foreign shipments for the year. Domestic sales for May total so far slightly over 10,000 tons, the price now being steady at 10c. a lb., for electrolytic grades delivered Connecticut points.

Tin

Domestic tin consumers are well supplied with stocks, unseen inventories probably being in the neighborhood of 15,000 tons, and are, therefore showing no interest in new commitments. This indifference, of course, continues to depress quotations both here and in London, the New York price on spot Straits dropping from 38.25c. last Thursday to 36.375c. today. This low price, or even lower prices, will probably excite no interest, what with the automobile industry operating on a skeleton schedule and the tin plate industry hard put to maintain the present low production level. The London market today was quiet, with spot metal at £162 5s., three-months metal at £162 15s., and the Singapore market at £167.

Zinc

Although sales of prime Western continue to lag, there is still enough demand drifting into the market to maintain prices steadily at 4c. a lb., East St. Louis, and 4.39c., New York. Sales last week totaled 2750 tons, mostly at the 4c. price level, shipments of prime Western for the same period being 2426 tons, and undelivered contracts now stand at 24,529 tons. Joplin ore prices are apparently steady at \$27 a ton for mill grades and \$26 for flotation grades, with smelters in general asking for considerably more ore than mines were willing to release. With ore production being curtailed more drastically each week, the Joplin prices have a good basis on which to remain firm.

Lead

Consumer buying, although far from impressive, is none the less showing a slight improvement over previous weeks. The bulk of demands is for immediate shipment, very few users being inclined to commit themselves at the present moment for late June positions. Consumer stocks are at a low level, and any revival in consumption would certainly reflect sharply in the price situation. Current transactions are well distributed among all consuming outlets, and prices are steady at 4.35c. per lb., St. Louis, and 4.50c., New York.

The Week's Prices. Cents Per Pound for Early Delivery

	May 11	May 12	May 13	May 14	May 16	May 17
Electrolytic copper, Conn.*	10.00	10.00	10.00	10.00	10.00	10.00
Lake copper, N. Y.	10.125	10.125	10.125	10.125	10.125	10.125
Straits tin, spot, New York	37.85	38.25	38.10		37.10	36.375
Zinc, East St. Louis	4.00	4.00	4.00	4.00	4.00	4.00
Zinc, New York	4.39	4.39	4.39	4.39	4.39	4.39
Lead, St. Louis	4.35	4.35	4.35	4.35	4.35	4.35
Lead, New York	4.50	4.50	4.50	4.50	4.50	4.50

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
Aluminum, virgin, 99 per cent plus 20.00c.-21.00c. a lb., delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 14.75c. a lb., prompt, f.o.b., New York.
Antimony, American, 12.75c. per lb., prompt shipment, New York.
Quicksilver, \$70.00 to \$71.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 10.25c. a lb., less carload, delivered in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	39.25c. to 40.25c.
Tin, bar	41.25c. to 42.25c.
Copper, Lake	11.00c. to 12.00c.
Copper, electrolytic	11.00c. to 12.00c.
Copper, castings	10.50c. to 10.75c.
*Copper sheets, hot-rolled	18.125c.
*High brass sheets	16.375c.
*Seamless brass tubes	19.125c.
*Seamless copper tubes	18.625c.
*Brass rods	12.375c.
Zinc, slabs	6.25c. to 7.25c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.50c.
Lead, American pig	5.50c. to 6.50c.
Lead, bar	6.25c. to 7.625c.
Lead, sheets, cut	7.75c.
Antimony, Asiatic	15.50c. to 16.50c.
Alum., virgin, 99 per cent plus	22.50c. to 24.00c.
Alum., No. 1 for remelting, 98 to 99 per cent	19.50c. to 21.00c.
Solder, ½ and ½	29.00c. to 31.00c.
Babbitt metal, commercial grade	19.00c. to 49.00c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 25 per cent allowed off for extras, except copper sheets and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	41.25c.
------------------	---------

Tin, bar	43.25c.
Copper, Lake	11.00c. to 11.25c.
Copper, electrolytic	11.00c. to 11.25c.
Copper, castings	10.75c.
Zinc, slabs	7.00c. to 7.25c.
Lead, American pig	5.00c. to 5.25c.
Lead, bar	8.25c.
Antimony, Asiatic	18.00c. to 18.50c.
Babbitt metal, medium grade	17.75c.
Babbitt metal, high grade	45.25c.
Solder, ½ and ½	24.75c.

Old Metals Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.50c.	8.25c.
Copper, hvy. and wire	6.75c.	7.25c.
Copper, light and bottoms	6.00c.	6.25c.
Brass, heavy	4.00c.	4.50c.
Brass, light	3.00c.	3.75c.
Hvy. machine composition	6.00c.	6.50c.
No. 1 yel. brass turnings	4.375c.	4.875c.
No. 1 red brass or compos. turnings	5.75c.	6.25c.
Lead, heavy	3.50c.	3.875c.
Cast aluminum	6.00c.	7.25c.
Sheet aluminum	10.50c.	12.00c.
Zinc	2.00c.	3.25c.

IRON AND STEEL SCRAP

... Further weakness seen in most markets on basis of light transactions ... Composite declines 33c. to \$11.42.

MAY 17.—What appeared last week to be the bottom of the recent market decline turns out merely to have been a resting point on the way down. Most markets have exhibited weakness this week and, on the basis of small sales into consumption, the price of No. 1 steel is off 25c. to 50c. THE IRON AGE composite, based on the average of Pittsburgh, Chicago and Philadelphia No. 1 steel prices, has declined 33c. to \$11.42 after holding at \$11.75 for two weeks. It is now \$10.50 below the 1937 high of \$21.92. Sales of bundles at Detroit have weakened the whole list there and will have an influence on the Buffalo market since the first boatload of Detroit bundles arrived there last week. Incidentally, the principal Buffalo consumer has lowered its offering price on No. 1 steel 50c. This has been one of the most active markets for some time.

Reflecting the lack of promise of new business, some of the exporters in the New York district have lowered their buying prices \$1 on Nos. 1 and 2 steel. This action followed declines of \$1 to \$2 the week before.

Cleveland

Scrap quotations are unchanged this week, reflecting the stagnant condition of the markets here and in Youngstown. Small mill releases at Warren, Ohio, mostly for No. 2 grades, are not big enough to affect quotations to any noticeable extent.

Pittsburgh

The market is slightly softer in the past week and one consumer has been able to obtain slightly less than 1000 tons of No. 1 steel at \$11.25. No. 1 steel has also been offered in limited quantities at \$13.50. On the other hand, some brokers are covering on No. 1 steel orders at \$11.75; hence this grade is quoted this week at \$11.25 to \$11.75, off 25c. a ton from last week's price. There is no indication of a strengthening in the market in the immediate future. Railroad specialties and other low phos grades are also weaker. Railroad heavy melting is off 25c. a ton and this week's quotations reflect the range in prices obtained on recent lists.

Chicago

A sale to a local mill last week at \$11 has caused a general reduction in prices in this district, heavy melting steel being

quoted at \$10.50 to \$11, down 50c. a ton. Reductions have been made in other grades ranging from 50c. to \$1. Little is in sight for the scrap trade here over the summer, as consumers are unable to forecast an improvement in operations.

Philadelphia

Activity here continues to be ruled by uncertainty, the primary price trend being on the weak side. The current low quotations are discouraging yard conversions, and about the only material moving are stray carloads of distress scrap. Holders of accumulations believe that higher prices will quickly show as soon as steel making exhibits a better tone, which will likely come about by September; but mills, on the other hand, are still showing no disposition to speculate by building up inventories at present price levels. Sentiment and small-lot deliveries on old orders together have served to force No. 1 steel to a \$12 level, with accompanying decreases in machine shop turnings, blast furnace and cast grades.

Buffalo

The market again has weakened, with the principal consumer lowering its offering price for No. 1 heavy melting steel to \$11. This means \$9 for No. 2 steel and \$9.50 for No. 1 bundles and \$8 for old bundles. This mill will pay \$5 for machine shop turnings. The influence of Lake shipments soon will be apparent in this market, since the first boatload of Detroit scrap, a cargo of No. 1 bundles, has been received during the past week.

St. Louis

Scrap iron dealers report that there is no buying by the steel mills in the district, and there is nothing to look forward to for several months. One of the large consumers has suspended shipments on orders placed several weeks ago. Selected and No. 1 heavy melting steel are down 25c. a ton.

Cincinnati

Trading in old materials is virtually absent from the market. Occasional small orders of no market significance make up current business. Shipments on the remaining old commitments are accepted by mills, but no other consuming interest is present. Prices are unchanged, but nominal.

Detroit

The downward price trend, interrupted briefly for a few weeks in the Detroit area, has been resumed with an almost general drop of 50c. a ton indicated by most recent sales. Bundles led the list of activity and set the pace in price

reductions. While earlier it had been believed that most of the scrap production could be absorbed at prevailing prices, pessimism now has the upper hand. Yard operators for the most part express the opinion that they can no longer invest in inventories which have little prospect of moving before fall.

New York

Lack of new orders has caused two of the exporters to drop their buying prices on Nos. 1 and 2 steel \$1 a ton. Since one of the leading factors is still holding to the level established last week of \$9.50 and \$8, respectively, a spread of \$1 is shown in the two principal grades. Buying prices on stove plate and No. 2 cast are unchanged. Prices for material on cars for domestic consumption have been reduced on a few grades nominally in line with changes in the Philadelphia market.

Boston

The situation today is such that listed quotations mean little or nothing. Demand, so far as domestic consumers are concerned, is practically nil, even New England foundries evincing almost no interest in machinery and textile cast. Unfilled export orders are down to a couple of boats or so, with no new business in view. Exporters are covered on these boats, and because of the stagnant domestic market very few scrap dealers are inclined to stock material in yards.

Supreme Court Again Supports Labor Board

WASHINGTON.—Strikers retain the status of employees under the National Labor Relations Act and discrimination against union leaders therefore is illegal, the Supreme Court held Monday. Marking another victory for the National Labor Relations Board, the court in a 7 to 0 decision—Justices Cardozo and Reed not participating—reversed a finding of the Ninth Circuit Court, which set aside a board order demanding that the Mackay Radio & Telegraph Co. reinstate, with back pay, five striking telegraphers in San Francisco in 1935.

The Supreme Court said the board found sufficient evidence to justify board findings that the company had refused reinstatement of the telegraphers because of union activity. The board, said the Supreme Court, is empowered to compel reinstatement of union workers when discrimination has been practiced.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel...	\$11.25 to \$11.75
Railroad hvy. mltng. steel...	12.75 to 13.25
No. 2 hvy. mltng. steel...	10.00 to 10.50
Scrap rails	15.00 to 15.50
Rails 3 ft. and under...	17.50 to 18.00
Comp. steel	11.25 to 11.75
Hand bundled sheets...	10.00 to 10.50
Hvy. steel axle turn...	10.00 to 10.50
Machine shop turn...	6.50 to 7.00
Short shov. turn...	6.50 to 7.00
Mixed bor. & turn...	6.00 to 6.50
Cast iron borings	6.00 to 6.50
Cast iron carwheels...	13.00 to 13.50
Hvy. breakable cast...	11.00 to 11.50
No. 1 cupola cast...	13.50 to 14.00
RR. knuckles & clips...	14.50 to 15.00
Rail coll. & leaf springs...	15.00 to 15.50
Rolled steel wheels...	15.00 to 15.50
Low phos. billet crops...	15.50 to 16.00
Low phos. punchings...	14.00 to 14.50
Low phos. plate	14.50 to 15.00

PHILADELPHIA

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel	\$12.00
No. 2 hvy. mltng. steel...	\$9.50 to 10.00
Hydraulic bund., new...	11.50 to 12.00
Hydraulic bund., old...	8.50 to 9.00
Steel rails for rolling...	16.00 to 16.50
Cast iron carwheels...	14.50 to 15.00
Hvy. breakable cast...	12.50 to 13.00
No. 1 cast	14.00 to 14.50
Stove plate (steel wks)	10.00 to 10.50
Railroad malleable	15.00 to 15.50
Machine shop turn...	6.50
No. 1 blast furnace	6.00
Cast borings	6.00
Heavy axle turnings...	8.50 to 9.00
No. 1 low phos. hvy...	16.50 to 17.00
Couplers & knuckles...	16.00 to 16.50
Rolled steel wheels...	16.00 to 16.50
Steel axles	20.00 to 20.50
Shafting	19.00 to 19.50
No. 1 RR. wrought...	15.00 to 15.50
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire	11.00 to 11.50
Cast borings (chem.)...	10.00 to 10.50

CHICAGO

Delivered to Chicago district consumers:

Per Gross Ton	
Hvy. mltng. steel.....	\$10.50 to \$11.00
Auto. hvy. mltng. steel alloy free	9.00 to 9.50
No. 2 auto. steel	8.50 to 9.00
Shoveling steel	10.50 to 11.00
Hydraul. comp. sheets	9.50 to 10.00
Drop forge flashings...	8.25 to 8.75
No. 1 busheling	9.25 to 9.75
No. 2 busheling, old...	3.75 to 4.25
Rolled carwheels	13.00 to 13.50
Railroad tires, cut...	14.50 to 15.00
Railroad leaf springs...	14.00 to 14.50
Steel coup. & knuckles	13.00 to 13.50
Axle turnings	10.00 to 10.50
Coil springs	15.00 to 15.50
Axle turn. (elec.)...	10.00 to 10.50
Low phos. punchings...	13.50 to 14.00
Low phos. plates, 12 in. and under	12.50 to 13.00
Cast iron borings	3.50 to 4.00
Short shov. turn...	5.00 to 5.50
Machine shop turn...	3.50 to 4.00
Rerolling rails	13.75 to 14.25
Steel rails under 3 ft.	14.00 to 14.50
Steel rails under 2 ft.	14.50 to 15.00
Angle bars, steel...	12.50 to 13.00
Cast iron carwheels...	12.25 to 12.75
Railroad malleable	11.75 to 12.25
Agric. malleable	10.00 to 10.50
Per Net Ton	
Iron car axles	\$16.50 to \$17.00
Steel car axles	15.00 to 15.50
No. 1 RR. wrought...	8.00 to 8.50
No. 2 RR. wrought...	9.25 to 9.75
Locomotive tires	14.25 to 14.75
Pipes and flues	9.75 to 10.25
No. 1 machinery cast...	10.50 to 11.00
Clean auto. cast...	9.50 to 10.00
No. 1 railroad cast...	9.75 to 10.25
No. 1 agric. cast...	9.50 to 10.00

YOUNGSTOWN

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel...	\$11.00 to \$11.50
Hydraulic bundles	10.50 to 11.00
Machine shop turn...	7.00 to 7.50

CLEVELAND

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel...	\$10.50 to \$11.00
No. 2 hvy. mltng. steel...	9.50 to 10.00
Comp. sheet steel	10.00 to 10.50
Light bund. stampings...	7.50 to 8.00
Drop forge flashings...	9.00 to 9.50
Machine shop turn...	5.00 to 5.50
Short shov. turn...	5.50 to 6.00
No. 1 busheling	9.00 to 9.50
Steel axle turnings	8.50 to 9.00
Low phos. billet and bloom crops	17.00 to 17.50
Cast iron borings	5.50 to 6.00
Mixed bor. & turn...	5.50 to 6.00
No. 2 busheling	5.50 to 6.00
No. 1 cast	14.00 to 14.50
Railroad grate bars	6.50 to 7.00
Stove plate	6.00 to 6.50
Rails under 3 ft.	16.00 to 16.50
Rails for rolling	14.00 to 14.50
Railroad malleable	13.00 to 13.50
Cast iron carwheels...	13.00 to 13.50

BUFFALO

No. 1 hvy. mltng. steel...	
No. 1 hvy. mltng. steel...	\$10.50 to \$11.00
No. 2 hvy. mltng. steel...	8.50 to 9.00
Scrap rails	12.00 to 12.50
New hvy. b'ndled sheets	9.00 to 9.50
Old hydraul. bundles...	7.50 to 8.00
Drop forge flashings...	8.50 to 9.00
No. 1 busheling	8.50 to 9.00
Hvy. axle turnings...	8.50 to 9.00
Machine shop turn...	4.50 to 5.00
Knuckles & Couplers...	14.00 to 14.50
Coil & leaf springs...	14.00 to 14.50
Rolled steel wheels...	14.00 to 14.50
Low phos. billet crops...	15.00 to 15.50
Shov. turnings	6.00 to 6.50
Mixed bor. & turn...	4.50 to 5.00
Cast iron borings	4.50 to 5.00
Steel car axles	14.00 to 14.50
No. 1 machinery cast...	13.00 to 13.50
No. 1 cupola cast...	12.00 to 12.50
Stove plate	10.50 to 11.00
Steel rails under 3 ft.	15.00 to 15.50
Cast iron carwheels...	12.00 to 12.50
Railroad malleable	11.50 to 12.00
Chemical borings	7.50 to 8.00

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting...	\$10.25 to \$10.75
No. 1 hvy. melting...	10.25 to 10.75
No. 2 hvy. melting...	9.75 to 10.00
No. 1 locomotive tires...	11.50 to 12.00
Misc. stand. sec. rails...	11.50 to 12.00
Railroad springs	13.00 to 13.50
Bundled sheets	5.50 to 6.00
No. 1 busheling	7.00 to 7.50
Cast bor. & turn...	2.50 to 3.00
Machine shop turn...	2.50 to 3.00
Heavy turnings	8.00 to 8.50
Rails for rolling	13.00 to 13.50
Steel car axles	17.00 to 17.50
Iron car axles	19.50 to 20.00
No. 1 RR. wrought...	7.50 to 8.00
No. 2 RR. wrought...	10.00 to 10.50
Steel rails under 3 ft.	13.00 to 13.50
Steel angle bars	11.50 to 12.00
Cast iron carwheels...	11.50 to 12.00
No. 1 machinery cast...	11.00 to 11.50
Railroad malleable	10.50 to 11.00
No. 1 railroad cast	10.00 to 10.50
Stove plate	6.50 to 7.00
Agricul. malleable	9.00 to 9.50
Grate bars	6.50 to 7.00
Brake shoes	6.50 to 7.00

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel...	\$8.00 to \$8.50
No. 2 hvy. mltng. steel...	6.00 to 6.50
Scrap rails for mltng.	12.75 to 13.25
Loose sheet clippings...	3.50 to 4.00
Hydraul. b'ndled sheets	7.50 to 8.00
Cast iron borings	2.00 to 2.50
Machine shop turn...	2.50 to 3.00
No. 1 busheling	6.25 to 6.75
No. 2 busheling	1.50 to 2.00
Rails for rolling	14.75 to 15.25
No. 1 locomotive tires...	11.50 to 12.00
Short rails	15.25 to 15.75
Cast iron carwheels...	10.00 to 10.50
No. 1 machinery cast...	10.00 to 10.50
No. 1 railroad cast...	8.50 to 9.00
Burnt cast	5.00 to 5.50
Stove plate	5.00 to 5.50
Agricul. malleable	9.25 to 9.75
Railroad malleable	11.25 to 11.75
Mixed hvy. cast	6.75 to 7.25

BIRMINGHAM

Per gross ton delivered to consumer:	
Hvy. melting steel	\$11.50 to \$12.00
Scrap steel rails	14.00 to 14.50
Short shov. turnings...	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought...	10.00
Rails for rolling	15.00 to 16.00
No. 1 cast	14.00 to 16.50
Tramcar wheels	14.00 to 15.00

DETROIT

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel...	\$6.50 to \$7.00
No. 2 hvy. mltng. steel...	5.50 to 6.00
Borings and turnings...	3.00 to 3.50
Long turnings	2.75 to 3.25
Short shov. turnings...	3.50 to 4.00
No. 1 machinery cast...	11.75 to 12.25
Automotive cast	12.25 to 12.75
Hvy. breakable cast...	9.50 to 10.00
Hydraul. comp. sheets...	7.00 to 7.50
Stove plate	6.75 to 7.25
New factory bushel...	6.00 to 6.50
Old No. 2 busheling...	2.00 to 2.50
Sheet clippings	4.00 to 4.50
Flashings	5.50 to 6.00
Low phos. plate scrap...	7.50 to 8.00

NEW YORK

Dealers' buying prices per gross ton on cars:	
No. 1 hvy. mltng. steel...	\$7.75 to \$8.00
No. 2 hvy. mltng. steel...	5.75 to 6.00
Hvy. breakable cast...	8.50 to 9.00
No. 1 machinery cast...	10.00 to 10.50
No. 2 cast	7.00 to 7.50
Stove plate	6.00 to 6.50
Steel car axles	20.00 to 20.50
Shafting	15.00 to 15.50
No. 1 RR. wrought...	11.00 to 11.50
No. 1 wrought long...	9.50 to 10.00
Spec. iron & steel pipe	8.50 to 9.00
Rails for rolling	16.00 to 16.50
Clean steel turnings*	2.50 to 3.00
Cast borings*	2.50 to 3.00
No. 1 blast furnace...	2.50 to 3.00
Cast borings (chem.)...	9.50 to 10.00
Unprepared yard scrap	4.50 to 5.00
Light iron	3.00 to 3.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast.....	\$14.00 to \$15.00
No. 2 cast	11.50 to 12.00

*\$1.50 less for truck loads.

BOSTON

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel...	\$13.30 to \$13.80
Scrap rails	13.30 to 13.80
No. 2 steel	12.30 to 12.80
Breakable cast	9.75
Machine shop turn...	1.45
Mixed bor. & turn...	1.45
Bun. skeleton long	4.25 to 4.35
Shafting	17.00 to 17.50
Cast bor. chemical...	6.00 to 6.50
Per gross ton delivered consumers' yards:	
Textile cast	15.00 to 15.50
No. 1 machine cast...	15.00 to 15.50

PACIFIC COAST

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel...	\$11.65 to \$12.15
No. 2 hvy. mltng. steel...	10.65 to 11.15

CANADA

Dealers' buying prices at their yards, per gross ton:	
Toronto Montreal	
No. 1 hvy. mltng. steel...	\$10.50 \$9.50
No. 2 hvy. mltng. steel...	9.50 8.50
Mixed dealers steel...	8.50 7.50
Scrap pipe	8.50 7.50
Steel turnings	7.50 7.00
Cast borings	8.50 7.50
Machinery cast	15.00 14.00
Dealers cast	13.00 12.00
Stove plate	11.00 10.50

EXPORT

Dealers' buying prices per gross ton:	
New York, truck lots, delivered, barges	
No. 1 hvy. mltng. steel...	\$8.50 to \$9.50
No. 2 hvy. mltng. steel...	7.00 to 8.00
No. 2 cast	7.00
Stove plate	6.00
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy. mltng. steel...	\$11.00
No. 2 hvy. mltng. steel...	10.00
Rails (scrap)	11.00
Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mltng. steel...	Nominal
No. 2 hvy. mltng. steel...	Nominal

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are \$2 a ton higher, and delivered Detroit \$3 higher.

Per Gross Ton
Rerolling\$37.00
Forging quality 43.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton
Open-hearth or Besse-
mer\$37.00

Skelp

Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.
Grooved, universal and
sheared2.10c.

Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton
Pittsburgh or Cleveland.....\$47.00
Chicago, Youngstown or Ander-
son, Ind. 48.00
Worcester, Mass. 49.00
Birmingham 50.00
San Francisco 56.00
Galveston 53.00
Rods over 9/32 in. or 47/64 in., in-
clusive, \$5 a ton over base.

SOFT STEEL BARS

Base per Lb.
Pittsburgh2.45c.
Chicago or Gary2.50c.
Duluth2.60c.
Detroit2.60c.
Cleveland2.50c.
Buffalo2.55c.
Philadelphia2.77c.
New York2.81c.
Birmingham2.60c.
On cars dock Gulf ports.....2.85c.
On cars dock Pacific ports.....3.00c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh2.30c.
Cleveland, Chicago, Gary or
Moline, Ill.2.35c.
Buffalo2.40c.
Birmingham2.45c.
On cars dock Gulf ports.....2.70c.
On cars dock Pacific ports.....2.85c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh2.45c.
Buffalo, Cleveland, Youngs-
town, Chicago, Gary or Bir-
mingham2.50c.
Detroit2.60c.
On cars dock Gulf ports.....2.85c.
On cars dock Pacific ports.....2.95c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh2.30c.
Buffalo, Cleveland, Youngs-
town, Chicago, Gary or Bir-
mingham2.35c.
On cars dock Gulf ports.....2.70c.
On cars dock Pacific ports.....2.80c.

IRON BARS

Chicago2.40c.
Pittsburgh (refined)3.60c.

COLD FINISHED BARS AND SHAFTING*

Base Per Lb.
Pittsburgh2.90c.
Cleveland, Chicago and Gary..2.95c.
Buffalo3.00c.
Detroit2.95c.

* In quantities of 10,000 to 19,999 lb.

PLATES

Base Per Lb.
Pittsburgh2.25c.
Chicago or Gary2.30c.
Cleveland2.45c.
Coatesville or Spar. Pt.....2.35c.
Philadelphia2.445c.
New York2.55c.

Birmingham2.40c.
On cars dock Gulf ports.....2.65c.
On cars dock Pacific ports.....2.80c.
Wrought iron plates, P'tg.....3.80c.

FLOOR PLATES

Pittsburgh3.50c.
Chicago3.55c.
Coatesville3.60c.
On cars dock Gulf ports.....3.90c.
On cars dock Pacific ports.....4.05c.

STRUCTURAL SHAPES

Base per Lb.
Pittsburgh2.25c.
Chicago2.30c.
Cleveland2.45c.
Buffalo or Bethlehem.....2.35c.
Philadelphia2.465c.
New York2.52c.
Birmingham (standard)2.40c.
On cars dock Gulf ports.....2.65c.
On cars dock Pacific ports.....2.80c.

STEEL SHEET PILING

Base per Lb.
Pittsburgh2.60c.
Chicago or Buffalo2.70c.
On cars dock Gulf or Pacific
Coast ports0.5c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than
60 lb., per gross ton.....\$42.50
Angle bars, per 100 lb.....2.80

F.o.b. Basing Points

Light rails (from billets) per
gross ton\$43.00
Light rails (from rail steel) per
gross ton42.00

Base per Lb.

Spikes3.15c.
Tie plates, steel2.30c.
Tie plates, Pacific Coast ports.2.40c.
Track bolts, to steam railroads 4.35c.
Track bolts, to jobbers, all sizes
(per 100 counts)

65-5 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS

Hot Rolled, 10 Gage

Base per Lb.
Pittsburgh2.40c.
Gary2.50c.
Detroit2.60c.
Philadelphia2.72c.
Granite City2.60c.
Birmingham2.55c.
On cars dock Pacific ports.....2.95c.
Wrought iron, Pittsburgh.....4.25c.

Hot Rolled Annealed, 24 Gage

Pittsburgh3.15c.
Gary3.25c.
Detroit3.35c.
Philadelphia3.47c.
Granite City3.35c.
Birmingham3.30c.
On cars dock Pacific ports.....3.80c.
Wrought iron, Pittsburgh.....5.15c.

Heavy Cold Rolled, 10 Gage*

Pittsburgh3.00c.
Gary3.10c.
Detroit3.20c.
Philadelphia3.32c.
Granite City3.20c.
Birmingham3.15c.
On cars dock Pacific ports.....3.60c.

Light Cold Rolled, 20 Gage*

Pittsburgh3.45c.
Gary3.55c.
Detroit3.65c.
Philadelphia3.77c.
Granite City3.65c.
Birmingham3.60c.
On cars dock Pacific ports4.00c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

Galvanized Sheets, 24 Gage

Pittsburgh3.80c.
Gary3.90c.
Philadelphia4.12c.
Granite City4.00c.
Birmingham3.95c.
On cars dock Pacific ports4.40c.
Wrought iron, Pittsburgh.....6.10c.

Electrical Sheets

(F.o.b. Pittsburgh)

Base per Lb.

Field grade3.35c.
Armature3.70c.
Electrical4.20c.
Special Motor5.10c.
Special Dynamo5.80c.
Transformer6.30c.
Transformer Special7.30c.
Transformer Extra Special....7.80c.

Base gage changed from 28 to 24 gage. Gage extras are the same as those applying on hot-rolled, annealed sheets with few exceptions.
Silicon Strip in coils—Sheet price plus sil-
con sheet extra width extras plus 25c. per 100
lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating
f.o.b. Pittsburgh4.10c.
F.o.b. Gary4.20c.
F.o.b. cars dock Pacific ports.4.80c.

Vitreous Enameling Stock, 20 Gage

Pittsburgh3.50c.
Gary3.60c.
Granite City3.70c.
On cars dock Pacific ports.....4.10c.

TIN MILL PRODUCTS

Black Plate, 28 Gage

Pittsburgh3.30c.
Gary3.40c.
Granite City3.50c.
On cars dock Pacific ports,
boxed4.175c.

Tin Plate

Base per Box

Standard cokes, Pittsburgh.....\$5.35
Standard cokes, Gary5.45
Standard cokes, Granite City....5.55

Special Coated Manufacturing Ternes

Base per Box

Pittsburgh\$4.65
Gary4.75
Granite City4.85

Roofing Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)
8-lb. coating I.C.....\$12.00
15-lb. coating I.C.....14.00
20-lb. coating I.C.....15.00
25-lb. coating I.C.....16.00
30-lb. coating I.C.....17.25
40-lb. coating I.C.....19.50

HOT ROLLED STRIP

(Widths up to 24 in.)

Base per Lb.

Pittsburgh2.40c.
Chicago2.50c.
Detroit2.60c.
Granite City2.60c.
Birmingham2.55c.

Cooperage Stock

Pittsburgh2.50c.
Chicago2.60c.

COLD ROLLED STRIP*

Base per Lb.

Pittsburgh3.20c.
Cleveland3.20c.
Chicago3.49c.
Worcester3.10c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

No. 14, Pitts'gh or Cleveland. 3.35c.
No. 14, Worcester3.75c.
No. 20, Pitts'gh or Cleveland. 3.75c.
No. 20, Worcester4.15c.

COLD ROLLED SPRING STEEL

Pittsburgh and

Cleveland Worcester

Carbon 0.25-0.50% 3.20c. 3.40c.
Carbon .51-.75 4.45c. 4.65c.
Carbon .76-1.00 6.30c. 6.50c.
Carbon Over 1.00 8.50c. 8.70c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

	Per Lb.
Bright wire	2.90c.
Galvanized wire	2.95c.
Spring wire	3.50c.
Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$3 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.	

To the Trade

	Base per Keg
Standard wire nails	\$2.75
Smooth coated nails	2.75
Cut nails, carloads	3.60

Base per 100 Lb.

Annealed fence wire	\$3.15
Galvanized fence wire	3.55
Polished staples	3.45
Galvanized staples	3.70
Barbed wire, galvanized	3.40
Twisted barless wire	3.40
Woven wire fence, base column. 74	
Single loop bale ties, base col. 63	
Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh; Duluth, Minn., mill prices are \$2 a ton over Pittsburgh, except for woven wire fence, which is \$3 over Pittsburgh and Birmingham mill prices are \$3 a ton over Pittsburgh).	

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of \$6 a ton over Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh

District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

In.	Black	Galv.	In.	Black	Galv.
1/8	52	31	1/8	52	31
1/4	55	38 1/2	1/4	55	38 1/2
3/8	59 1/2	49	3/8	59 1/2	49
1/2	62 1/2	53	1/2	62 1/2	53
3/4	64 1/2	55 1/2	3/4	64 1/2	55 1/2

Lap Weld

2	57	47 1/2	2	57	47 1/2
2 1/2	3.60	50 1/2	2 1/2	3.60	50 1/2
3 1/2	6.62	52 1/2	3 1/2	6.62	52 1/2
7	8.61	50 1/2	7	8.61	50 1/2
9 & 10	60 1/2	50	9 & 10	60 1/2	50
11 & 12	59 1/2	49	11 & 12	59 1/2	49

Butt Weld, extra		strong, plain ends			
1/8	50 1/2	36 1/2	1/8 & 3/8 +14 +48		
1/4	52 1/2	40 1/2	1/2	21	4
3/8	57 1/2	48 1/2	3/4	27	10
1/2	61 1/2	52 1/2	1 to 2	34	17 1/2
3/4	63	55			

Lap Weld, extra strong, plain ends	Lap Weld, extra strong, plain ends
2 .....55 46½	2 .....29½ 13½
2½ & 3.59 50½	2½ to 4.35 20½
3 & to 6.62½ 54	4½ to 6.33½ 19
7 & 8.61½ 54	7 & 8.34½ 19½
9 & 10.60½ 50	9 to 12.28 15½
11 & 12.59½ 49	

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes
(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G. \$ 9.46	\$ 8.41
1 1/4 in. o.d.	13 B.W.G. 11.21	9.96
1 1/2 in. o.d.	13 B.W.G. 12.38	11.00
1 3/4 in. o.d.	13 B.W.G. 14.09	12.51
2 in. o.d.	13 B.W.G. 15.78	14.02
2 1/4 in. o.d.	13 B.W.G. 17.60	15.63
2 1/2 in. o.d.	12 B.W.G. 19.37	17.21
2 3/4 in. o.d.	12 B.W.G. 21.22	18.85
3 in. o.d.	12 B.W.G. 22.49	19.98
3 1/2 in. o.d.	12 B.W.G. 23.60	20.97
4 in. o.d.	10 B.W.G. 45.19	40.15
4 1/2 in. o.d.	11 B.W.G. 29.79	26.47
5 in. o.d.	10 B.W.G. 36.96	32.83
5 1/2 in. o.d.	9 B.W.G. 56.71	50.38
6 in. o.d.	7 B.W.G. 87.07	77.35
Extra for less-carload quantities:		
40,000 lb. or ft. or over	Base	
30,000 lb. or ft. to 39,999 lb. or ft.	5%	
20,000 lb. or ft. to 29,999 lb. or ft.	10%	
10,000 lb. or ft. to 9,999 lb. or ft.	20%	
5,000 lb. or ft. to 4,999 lb. or ft.	30%	
2,000 lb. or ft. to 1,999 lb. or ft.	45%	
Under 2,000 lb. or ft.	65%	

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago	\$55.00
6-in. and larger, del'd New York	53.00
*6-in. and larger, Birmingham	47.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	56.00
F.o.b. dock, Seattle	56.00
4-in. f.o.b. dock, San Francisco or Los Angeles	59.00
F.o.b. dock, Seattle	56.00

Class "A" and gas pipe, \$3 extra
4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$46, Birmingham, and \$54 delivered Chicago and 4-in. pipe, \$49, Birmingham, and \$58 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:	
1/2 in. & 6 in. and smaller .....	.65 and 5*
Larger and longer up to	
1 in. ....	.60 and 10*
1 1/2 in. and larger .....	.60 and 5*
Lag bolts .....	.60 and 10
Plow bolts, Nos. 1, 2, 3	
and 7 .....	.65 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex. blank or tapped:	
1/2 in. and smaller .....	.65
9/16 in. to 1 in. inclusive .....	.60 and 5
1 1/2 in. and larger .....	.60

* Less carload lots and less than full container quantity. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-finished hexagon units, U.S.S. and S.A.E.

1/2 in. and smaller .....	.60 and 10
9/16 in. to 1 in. inclusive .....	.60 and 5
1 1/2 in. and larger .....	.60
Stove bolts in packages, nuts attached .....	.70
Stove bolts in packages, with nuts separate .....	.70 and 10
Stove bolts in bulk .....	.80

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(1/2-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland	\$3.60
F.o.b. Chicago or Birmingham	3.70

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh .....	.65 and 5
F.o.b. Cleveland .....	.65 and 5
F.o.b. Chicago and Birmingham .....	.65 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller .....	.50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller .....	.75
Milled headless set screws, cut thread 3/4 in. and smaller .....	.75
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller .....	.70 and 5
Upset set screws, cup and oval points .....	.80 and 5
Milled studs .....	.65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, \$60 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.	
Open-hearth grade, base	3.00c.
Delivered, Detroit	3.15c.
S.A.E.	
Series	Alloy
Numbers	Differential
200 (1 1/2% Nickel)	\$0.35
2100 (1 1/2% Nickel)	0.75
2300 (3 1/2% Nickel)	1.55

2500 (5% nickel)	\$2.25
3100 Nickel-chromium	0.79
3200 Nickel-chromium	1.35
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel - molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.36
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel-vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2 1/4 in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.60c. base per lb. Delivered Detroit, 3.75c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip ..	23.50c.	21.50c.
Cold-rolled strip ..	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No.	No.	No.	No.
	410	430	442	446
Bars ..	18.50c.	19c.	22.50c.	27.50c.
Plates ..	21.50c.	22c.	25.50c.	30.50c.
Sheets ..	26.50c.	29c.	32.50c.	36.50c.
Hot strip ..	17c.	17.50c.	23c.	28c.
Cold stp. ..	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, export	£20 Nominal
Tin plate, per base box	20s. 3d. to 21s. 6d.
Steel bars, open hearth	£11
Beams, open-hearth	£10 12s. 6d.
Channels, open-hearth	£10 17s. 6d.
Angles, open-hearth	£10 12s. 6d.
Black sheets, No. 24 gage	£14
Galvanized sheets, No. 24 gage	£16 15s.

CONTINENTAL

Per Gross Ton, Gold £.
f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet bars	Nominal
Plate 1/4 in. and up	£6 7s.
Plate 3/16 in. and 5 mm.	£6 13s.
Sheet, 1/4 in.	£7 9s. 6d.
Beams, Thomas	£4 15s.
Angles (Basic)	£4 15s.
Hoops and strip, base	£5 15s.

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

	Base per Lb.
Plates	3.70c.
Structural shapes	3.70c.
Soft-steel bars and small shapes	3.80c.
Reinforcing steel bars	2.45c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$4.48
Spikes, large	1 to 24 kegs \$3.65
Per Cent Off List	
Track bolts, all sizes per 100 count	55
Machine bolts, 100 count	**
Carriage bolts, 100 count	**
Nuts, all styles, 100 count	**
Large rivets, base per 100 lb.	\$4.35
Wire, black, soft ann'd, base per 100 lb.	\$3.30
Wire, galv. soft, base per 100 lb.	\$3.70
Common wire nails, per keg	\$2.90
Cement coated nails, per keg	\$2.90

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

*Delivered in Pittsburgh switching district.

**Prices on application.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.75c.
Soft steel bars, rounds	3.85c.
Soft steel bars, squares and hexagons	4.00c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	4.10c.
Hot-rolled annealed sheets (No. 24)	4.60c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	\$1.40
Track bolts (keg lots)	5.60
Rivets, structural (keg lots)	**4.95
Rivets, boiler (keg lots)	**5.05
Per Cent Off List	
Machine bolts and carriage bolts, 1/2 in. and smaller	60
Lag screws	*55 and 5
Hot-pressed nuts, sq. and hex., tap or blank, 1/2 by 6 in. and smaller	60
Hex. head cap screws	60
Cut point set screws	75
Flat head bright wood screws	62 and 20
Spring cotters	45
Stove bolts in full packages	72 1/2
Rd. hd. tank rivets, 7/16 in. and smaller	55
Wrought washers	\$3.75 off list
Black ann'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	\$4.55
Com. wire nails, 15 kegs or more, per keg	\$3.20
Cement c't'd nails, 15 kegs or more, per keg	\$3.20

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

**Base at 100 lb.

NEW YORK

	Base per Lb.
Plates, 1/4 in. and heavier	4.02c.
Structural shapes	3.99c.
Soft steel bars, round	4.16c.
Iron bars, Swed. charcoal	7.50 to 8.25c.
Cold-fin. shafting and screw stock:	
Rounds, squares, hexagons	4.61c.
Flats up to 12 in. wide	4.61c.

Cold-rolled; strip, soft and quarter hard	3.96c.
Hoops	4.36c.
Bands	4.36c.
Hot-rolled sheets (10 ga.)	4.00 to 4.11c.
Hot-rolled ann'd sheets (24 ga.)	4.50c.
Galvanized sheets (24 ga.)	4.75c.
Long term sheets (24 ga.)	5.50 to 6.20c.
Armco iron, galv. (24 ga.)	6.25c.
Toncan iron, galv. (24 ga.)	6.25c.
Galvanneal (24 ga.)	6.50c.
Armco iron hot-rolled (10 ga.)	4.60c.
Toncan iron, hot-rolled (10 ga.)	4.60c.
Cold-rolled sheets (20 ga.)	
Standard quality	5.20c.
Deep drawing	5.85c.
Stretcher leveled	5.85c.
SAE, 2300, hot-rolled	7.84c.
SAE, 3100, hot-rolled	6.39c.
SAE, 6100, hot-rolled, annealed	10.54c.
SAE, 2300, cold-rolled	9.04c.
SAE, 3100, cold-rolled, annealed	8.59c.
Floor plate, 1/4 in. and heavier	5.62c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.65c.
Wire, galv. (No. 9)	5.00c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, per keg in 25 keg lots	\$3.25

Per Cent Off List

Machine bolts, square head and nut 60	
Carriage bolts, cut thread	60
Nuts, hot pressed and cold punched, all types	55

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	4.02c.
Bars, soft steel (rounds and flats)	4.12c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.27c.
Cold-fin. rounds, shafting, screw stock	4.57c.
Hot-rolled annealed sheets (No. 24)	4.87c.
Galv. sheets (No. 24*)	5.52c.
Hot-rolled sheets (No. 10)	4.12c.
Black corrug. sheets (No. 24*)	4.92c.
2 galv. corrug. sheets	5.57c.
Structural rivets	5.32c.
Boiler rivets	5.42c.

Per Cent Off List

Tank rivets, 7/16 in. and smaller 50	
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, nuts; all quantities	60

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, 1/4-in. and heavier	3.92c.
*Structural shapes	3.92c.
*Soft steel bars, small shapes, iron bars (except bands)	4.03c.
*Reinforc. steel bars, square and deformed	3.46c.
Cold-finished steel bars	4.56c.
*Steel hoops	4.63c.
*Steel hands, No. 12 and 3/16 in. incl.	4.13c.
*Spring steel	5.50c.
*Hot-rolled anneal. sheets (No. 24)	4.65c.
*Galvanized sheets (No. 24)	4.90c.
*Hot-rolled annealed sheets (No. 10)	4.03c.
*Diam. pat. floor plates, 1/4 in.	5.25c.

These prices are for delivery in Philadelphia trucking area.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

† For 25 bundles or over.

‡ For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.89c.
Soft steel bars	3.75c.
Reinfor. bars (under 2000 lb.)	3.00c.
Cold-fin. bars (1000 lb. over)	4.30c.
Hot-rolled strip, 6 in. wide and under	4.19c.

Cold-finished strip	3.60c.
Hot-rolled annealed sheets No. 24 (under 1500 lb.)	4.69c.
Galvanized sheets (No. 24)	5.34c.
Hot-rolled sheets (No. 10)	3.94c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.94c.
Floor plates, 3/16 in. and heavier	5.49c.
*Black ann'd wire, per 100 lb.	\$3.40
*No. 9 galv. wire, per 100 lb.	3.80
*Con. wire nails, base per keg	2.95
Per Cent Off List	
Machine and carriage bolts, small	65 and 5
Large (to and incl. 1 in. diam.)	60 and 10
1 1/4 in. and larger	60 and 5
Nuts, 100 count	
1/2 in. and smaller	65 and 5
9/16 in. to 1 in.	60 and 5
1 1/4 in. and larger	60 and 5

* For 5000 lb. or less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.95c.
Floor plates	5.55c.
Bars, rounds, flats and angles	4.05c.
Other shapes	4.20c.
Rail steel reinforc. bars	3.75c.
Hoops and bands, 3/16 in. and lighter	4.25c.
Cold-finished bars	4.50c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.60c.
Galv. sheets (No. 24) 3500 lb. or more	\$5.25
Hot-rolled sheets (No. 10)	4.00c.
Small rivets	.55 per cent off list
No. 9 ann'd wire, per 100 lb. (1000 lb. or over)	\$3.48
Com. wire nails, base per keg: Any quantity less than carload	3.20
Cement c't'd nails, base 100-lb. keg	3.50
Chain. lin. per 100 lb.	8.35
Net per 100 Ft.	
Seamless steel boiler tubes, 2-in.	\$21.80
4-in.	52.45
Lap-welded steel boiler tubes, 2-in.	20.73
4-in.	48.41

BUFFALO

	Base per Lb.
Plates	3.95c.
Floor plates	5.55c.
Struc. shapes	3.80c.
Soft steel bars	3.90c.
Reinforcing bars	3.00c.
Cold-fin. flats and sq.	4.35c.
Rounds and hex.	4.35c.
Cold-rolled strip steel	3.82c.
Hot-rolled annealed sheets (No. 24)	4.83c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	4.00c.
Galv. sheet (No. 24)	5.38c.
Bands	4.25c.
Hoops	4.25c.
Heavy hot-rolled sheets	4.00c.
Com. wire nails base per keg	\$3.26
Black wire, base per 100 lb. (2500-lb. lots or under)	4.55c.
(Over 2500 lb.)	4.45c.

BOSTON

	Base per Lb.
Channels, angles	4.26c.
Tees and zeos, under 3 in.	4.51c.
H beams and shapes	4.10c.
Plates — Sheared, tank and univ. mill, 1/4 thick and heavier	4.11 to 4.61c.
Floor plates, diamond pattern	5.76c.
Bar and bar shapes (mild steel)	4.26c.
Bands 3/16 in. thick and No. 12 ga. incl.	4.46 to 5.46c.
Half rounds, half ovals, ovals and bevels	5.51c.
Tire steel	5.51c.
Cold-rolled strip steel	3.86c.
Cold-finished rounds, squares and hexagons	4.71c.
Cold-finished flats	4.71c.
Blue annealed sheets, No. 10 ga.	4.21c.
One pass cold-rolled sheets No. 24 ga.	5.16c.
Galvanized steel sheets, No. 24 ga.	5.15c.
Lead coated sheets, No. 24 ga.	6.61c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

Base per Lb.	
Soft steel bars	3.94c.
Structural shapes	3.95c.
Plates	3.95c.
Floor plates	5.55c.
Hot-rolled annealed sheets	
(No. 24)*	4.69c.
Hot-rolled sheets (No. 10)	3.94c.
Galvanized sheets (No. 24)**	5.40c.
Bands and hoops	4.19c.
Cold-finished bars	4.30c.
Cold-rolled strip	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	6.44c.

Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.

* Under 400 lb., .50c. over base, 400 to 1499 lb., base; 1500 to 3499 lb., base less .10c.; 3500 lb. and over, base less .15c.

** In Detroit only, 1500 to 3749 lb., base less 0.25c.; 3750 to 7499 lb., base less 0.40c.; 7500 lb. and over, base less 0.60c.

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

Base per Lb.	
Plates and structural shapes..	3.88c.
Soft steel bars, rounds up to 8 in., flats and fillet angles...	3.98c.
Soft steel bars, squares and hexagons	4.13c.
Hot-rolled strip	4.23c.
Hot-rolled annealed sheets (No. 24)	4.73c.
Galvanized sheets (No. 24)	5.38c.
Cold-finished steel bars	4.43c.
Structural rivets (keg lots)	5.18c.
Boiler rivets, cone head (keg lots)	5.28c.
Track spikes (keg lots)	4.63c.
Track bolts (keg lots)	5.83c.
Black annealed wire (No. 6 to No. 9 incl.)	3.85c.
Com. wire nails and cement coated nails	
100 to 4999 lb.	3.30c.

Per Cent Off List	
Machine bolts and carriage bolts, 1/2x6 and smaller or shorter...	65
Larger and longer up to 1 in. diam.	60-5
1 1/2 in. and larger	60
Coach and lag screws	60-5
Hot-pressed nuts, sq. and hex. tapped or blank, 1-199 lb.	50
200 lb. and over:	
1/2 in. and smaller	62 1/2
9/16 to 1 in.	60
1 1/2 in. and over	50-10

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

Base per Lb.	
Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.83c.
Hot-rolled annealed sheets, No. 24	4.75c.
Galvanized sheets, No. 24	5.00c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BIRMINGHAM

Base per Lb.	
Bars and bar shapes	\$3.85 base
Structural shapes and plates	3.75 "
Hot rolled sheets No. 10 ga.	3.80 "
Hot rolled sheets No. 24 ga.	4.40 "
Galvanized sheets No. 24 ga.	5.05 "
Strip	4.05 "
Reinforcing bars	3.85 "
Floor plates	5.96 "
Cold finished bars	4.91 "
Machine and carriage bolts	50 & 10 off list
Rivets (structural)	\$4.60 base
On plates, shapes, bars, hot-rolled strip, heavy hot-rolled sheets, the base applies on 400 to 3999 lb. All prices are f.o.b. consumer's plant.	

BALTIMORE

Base per Lb.	
Mild steel bars and small shapes	4.00c.
Structural shapes	3.90c.
Reinforcing bars, 5 to 15 tons	3.04c.
Plates	3.90c.
Hot-rolled sheets, No. 10	3.95c.
Bands	4.20c.
Hoops	4.45c.
Special threading steel	4.15c.
Checkered floor plates 1/4 in. and heavier	5.50c.
Galvanized sheets, No. 24, 100 lbs. or more	\$4.70
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	\$4.50

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 1999 lb. All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

Quantity differentials on the basis of combined weight of hot rolled products ordered in one day: Under 100 lb., add \$1; 100 to 399 lb., add 50c.; 400 to 1999 lb., base; 2000 to 9999 lb., deduct 20c.; 10,000 to 39,999 lb., deduct 30c.; 40,000 lb. and over, deduct 40c.

CHATTANOOGA

Base per Lb.	
Mild steel bars	4.25c.
Iron bars	4.25c.
Reinforcing bars	4.25c.
Reinforcing shapes	4.15c.
Plates	4.15c.
Hot-rolled sheets No. 10	4.20c.
Hot-rolled annealed sheets, No. 24*	4.10c.
Galvanized sheets No. 24*	4.70c.
Steel bands	4.45c.
Cold-finished bars	4.93c.

* Plus mill item extra.

MEMPHIS

Base per Lb.	
Mild steel bars	4.35c.
Shapes, bar size	4.35c.
Iron bars	4.35c.
Structural shapes	4.25c.
Plates	4.25c.
Hot-rolled sheets, No. 10	4.30c.
Hot-rolled annealed sheets, No. 24	4.95c.
Galvanized sheets, No. 24	5.70c.
Steel bands	4.60c.
Cold-drawn rounds	4.86c.
Cold-drawn flats, squares, hexagons	6.86c.
Structural rivets	5.25c.
Bolts and nuts, per cent off list	55
Small rivets, per cent off list	55

NEW ORLEANS

Base per Lb.	
Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	\$3.55
Bolts and nuts, per cent off list	60

PACIFIC COAST

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	4.05c.	4.30c.	4.25c.
Shapes, standard	4.05c.	4.30c.	4.25c.
Soft steel bars	4.20c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.975c.	2.975c.	2.975c.
Hot - rolled annealed sheets (No. 24)	5.15c.	5.05c.	5.35c.
Hot-rolled sheets (No. 10)	4.30c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.85c.	5.25c.	5.90c.
Galv. sheets (No. 22 and heavier)	6.10c.	5.45c.	5.90c.
Cold-finished steel Rounds	6.80c.	6.85c.	7.10c.
Squares and hexagons	8.05c.	8.10c.	7.10c.
Flats	8.55c.	8.60c.	8.10c.
Common wire nails—base per keg less carload	\$3.40	\$3.20	\$3.40

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

Per 1000 f.o.b. Works	
Super-duty brick, at St. Louis	\$60.80
First quality Pennsylvania, Maryland, Kentucky, Missouri and Illinois	47.50
First quality, New Jersey	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	42.75
Second quality, New Jersey	49.00
No. 1, Ohio	39.90
Ground fire clay, per ton	7.10

5 per cent trade discount on fire clay brick, except for New Jersey, quoted at net price.

Silica Brick

Per 1000 f.o.b. Works	
Pennsylvania	\$47.50
Chicago District	56.05
Birmingham	47.50
Silica cement per net ton (Eastern)	8.55
5 per cent trade discount on silica brick.	

Chrome Brick

Per Net Ton	
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	\$47.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	47.00

Magnesite Brick

Per Net Ton	
Standard f.o.b. Baltimore and Chester	\$67.00
Chemically bonded, f.o.b. Baltimore	57.00

Grain Magnesite

Per Net Ton	
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	\$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.50
Delivered Newark or Jersey City	26.53
Delivered Philadelphia	25.84
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
Delivered Cincinnati	24.44
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	22.00
Delivered, San Francisco, Los Angeles or Seattle	26.95
F.o.b. Birmingham*	20.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	\$25.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.61
Delivered Canton, Ohio	24.89
Delivered Mansfield, Ohio	25.44
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	\$26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.53
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago.	24.50
F.o.b. Birmingham	25.00
Delivered Cincinnati	25.61
Delivered Canton, Ohio	25.89
Delivered Mansfield, Ohio	26.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	\$28.50
---	---------

Gray Forge

Valley or Pittsburgh furnace	\$23.50
------------------------------	---------

Charcoal

Lake Superior furnace	\$27.00
Delivered Chicago	30.34

Canadian Pig Iron

Per Gross Ton

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	\$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.	
Domestic, 80% (carload)	\$102.50

Spiegeleisen

Per Gross Ton Furnace	
Domestic 19 to 21%	\$33.00
F.o.b. New Orleans	33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size	
50% (carload lots, bulk)	\$69.50*
50% (ton lots in 50 gal. bbl.)	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio	
Per Gross Ton	
10.00 to 10.50%	\$33.50
For each additional 0.50% silicon up to 17%, 50c. per ton is added.	
Manganese 2 to 3%, \$1 per ton additional.	
For each unit of manganese over 3%, \$1 per ton additional. Phosphorus 0.75% or over, \$1 per ton additional.	
Base prices at Buffalo are \$1.25 a ton higher than at Jackson.	

Silvery Iron

Per Gross Ton	
F.o.b. Jackson, Ohio, 5.00 to 5.50%	\$27.50
For each additional 0.5% silicon up to 17%, 50c. a ton is added.	
The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.	
Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.	

Ferrochrome

Per lb. Contained Cr., Delivered Carlots, Lump Size, on Contract	
4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-manganese

Per Gross Ton, Delivered, Lump Size, on Contract	
3% carbon	\$101.50*
2.50% carbon	106.50*
2% carbon	111.50*
1% carbon	121.50*

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads, nominally	\$2.00
Ferrotungsten, lots of 500 lbs. nominally	2.05
Ferrotungsten, smaller lots, nominally	2.10
Ferrovandium, contract, per lb. contained V., delivered	\$2.70 to \$2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots.	\$2.25†
Ferrocobaltititanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	\$142.50
Ferrocobaltititanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	\$157.50
Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton	\$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, \$3 unitage, freight equalized with Nashville	\$75.00
Ferromolybdenum, per lb. Mo. f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo. f.o.b. furnace	80c.

*Spot prices are \$5 per ton higher
†Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports	
Per Gross Ton	
Old range, Bessemer, 51.50%	\$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10
Mesabi, non-Bessemer, 51.50%	4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.A.F. Philadelphia or Baltimore	
Per Unit	
Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal	17.00c.
Iron, low phos., Swedish, average, 68½% iron. Nominally 17 to 18c.	
Iron, basic or foundry, Swedish, aver. 65% iron. Nominally 15c.	
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	45c.
Man., African, Indian, 44-48%	40c.
Man., African, Indian, 49-51%	Nominal
Man., Brazilian, 46 to 48½%	Nominally 40c.
Per Short Ton Unit	
Tungsten, Chinese, Wolframite, duty paid, delivered	\$19.00
Tungsten, domestic, scheelite delivered	\$16.00 to \$19.00
Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	\$16.00
Rhodesian, 45%	22.00
Rhodesian, 48%	25.50
Turkish, 48-49%	25.00 to \$26.00
Turkish, 45-46%	23.50 to 24.00
Turkish, 44%	19.00 to 19.50
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton:	
50%	\$25.50 to \$26.50
48-49%	25.50 to 26.00

FLUORSPAR

Per Net Ton	
Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	\$18.00 to \$19.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	20.00
Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	31.50

FUEL OIL

Per Gal.	
F.o.b. Bayonne or Baltimore, No. 3 distillate	4.75c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	4.75c.
Del'd Ch'go, No. 3 industrial	4.15c.
Del'd Ch'go, No. 5 industrial	4.00c.
Del'd Cleve'd, No. 3 distillate	5.00c.
Del'd Cleve'd, No. 4 industrial	5.25c.
Del'd Cleve'd, No. 5 industrial	3.50c.

COKE

Per Net Ton	
Furnace, f.o.b. Connells-ville, Prompt	\$4.00 to \$4.25
Furnace, f.o.b. Connells-ville, Prompt	5.00 to 6.25
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95
Foundry, by-product, delivered Cleveland	11.05
Foundry, by-product, delivered Cincinnati	10.50
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	11.00 to 11.50
Foundry, from Birmingham, f.o.b. cars dock, Pacific ports	14.75

FABRICATED STEEL

... Lettings only 4500 tons as against 14,950 tons last week . . . New projects lower at 6950 tons . . . Plate awards call for 1460 tons.

NORTH ATLANTIC STATES

AWARDS

- 800 Tons, Chappaqua, N. Y., building for Reader's Digest Association, Pleasantville, N. Y., to Bethlehem Fabricators, Inc., Bethlehem, Pa.
- 260 Tons, Washington, Lenox Vocational School, to Lehigh Structural Steel Co., Allentown, Pa.
- 250 Tons, Washington, warehouse, Woodward & Lathrop, to Fort Pitt Bridge Works Co., Pittsburgh.
- 185 Tons, Oneida County, N. Y., State bridge, to Harris Structural Steel Co., Plainfield, N. J.
- 170 Tons, Washington, alterations Georgia-Randolph building, Chesapeake & Potomac Telephone Co., to Barber & Ross, Washington.
- 150 Tons, Manchester, N. H., armory, to New England Structural Co., Everett, Mass.
- 100 Tons, Irasburg-Vershire, Vt., two State bridges, to Warnard Constructors, Inc., Cambridge, Mass.
- 180 Tons, Stamford, Conn., Norma-Hoffmann Bearings Corp., to Connecticut Iron Works, Stamford, Conn.
- 100 Tons, New York, Y.M.C.A. building at World's Fair, to F. G. Schaefer Iron Works, Edgewater, N. J.

THE SOUTH

- 100 Tons, Rome, Ga., Montgomery Ward store, to Southern Engineering Co., Charlotte, N. C.

CENTRAL STATES

- 400 Tons, Lincoln, Neb., subway, to Bethlehem Steel Co., Bethlehem, Pa.
- 230 Tons, Goodman, Wis., State bridge, to Bethlehem Steel Co., Bethlehem, Pa.

- 154 Tons, Kalamazoo, Mich., post office, to an unnamed fabricator.

- 130 Tons, Martell, Wis., State bridge, to Bethlehem Steel Co., Bethlehem, Pa.

- 130 Tons, Barry County, Mo., bridge, to Missouri Valley Bridge & Iron Co., Leavenworth, Kan.

- 124 Tons, Chicago, garage, to American Bridge Co., Pittsburgh.

- 115 Tons, Pawnee City, Neb., bridge, to Omaha Steel Works, Omaha, Neb.

- 100 Tons, Cerro Gordo County, Iowa, subway, to Fort Pitt Bridge Works Co., Pittsburgh.

- 100 Tons, Detroit, Northwest postal station, to Fort Pitt Bridge Works Co., Cleveland.

WESTERN STATES

- 780 Tons, Denver, State office building, to E. Burkhardt & Sons Steel & Iron Works Co., Denver.

- 100 Tons, Los Angeles, Philharmonic Auditorium repairs, to Pacific Iron & Steel Co., Los Angeles.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

- 250 Tons, Waterbury, Conn., building, Eastern Color Printing Co.

- 200 Tons, Rushville, N. Y., school; bids this week.

- 130 Tons, West Haverstraw, N. Y., shop building and laundry building for State.

- 130 Tons, Jamaica, Vt., two State bridges.

- 118 Tons, Jersey City, N. J., Clark Street bridge; bids June 1.

THE SOUTH

- 2100 Tons, Chickamauga, Ala., spillway gates and trash racks, TVA.

- 1500 Tons, Guntersville, Ala., power house for TVA.

- 1000 Tons, Baton Rouge, La., duPont building; bids this week.

- 180 Tons, Ashland, Ky., store building, S. H. Kress Co.

CENTRAL STATES

- 430 Tons, Indianapolis, Ind., factory addition, Link Belt Co.

- 250 Tons, Detroit, remodeling building, S. S. Kresge Co.

- 250 Tons, Columbus, Ohio, store building, H. L. Green.

- 200 Tons, Toledo, Ohio, Coca-Cola bottling works.

- 200 Tons, Springfield, Ohio, Y.M.C.A. building.

FABRICATED PLATES

AWARDS

- 1125 Tons, East Chicago, Ind., tanks for Sinclair Refining Co., to Graver Tank Co., East Chicago, Ind.

- 335 Tons, Akron, Ohio, standpipe, contract No. 297, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

NEW PROJECTS

- 4570 Tons, New York, Manhattan approach to Queens Tunnel, lining plates; Woodcrest & Rosoff Brothers Co. low bidder.

- 1100 Tons, Cleveland, Brookpark Road water mains; bids May 20.

- 850 Tons, Odair, Wash., gates for Grand Coulee Dam.

- 750 Tons, Oakland, Cal., 25 and 36-in. pipe for East Bay Municipal Utility District; Steel Tank & Pipe Co., Berkeley, Cal., low bidder.

- 300 Tons, Fort Peck, Mont., gates for dam.

- 280 Tons, Akron, Ohio, standpipe; bids taken May 17.

SHEET PILING

NEW PROJECTS

- 900 Tons, Los Angeles, 2500 pieces 20 ft. long for United States Engineer (Proposal 541); bids May 20.

- 100 Tons, Mud Run sewers; B. F. Perry, Akron, low bidder.

FINISHING operation on a journal for a 25,000 kilovolt amperes turbine generator being built in the East Pittsburgh Works, Westinghouse Electric & Mfg. Co., ordered by the Inland Steel Co. The rotor is 4 feet in diameter, 26 feet long and weighs 32½ tons. It will spin at the rate of 205 mi. an hour inside the generator.



THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

... Sales are dragging in most centers ... Lack of confidence appears to be holding back commitments for needed equipment ... Firms with Government contracts are buying, however.

No Pick-up Until Fall Seen at Cleveland

CLEVELAND—The expected purchase of around \$70,000 in equipment for a new Toledo vocational high school has aroused moderate interest in the market here in the absence of better developments recently. Meanwhile some of the inquiries for single tools reported in previous weeks have dropped by the wayside for one reason or another. Failure to obtain financial backing as expected has delayed several proposed new enterprises from going ahead, while the uncertainty surrounding the automotive industry's plans has been a factor for hesitancy. The preponderant opinion of most producers and dealers is that very little can be hoped for in the way of a pick-up until the fall. Some Government buying and purchases from England are expected. The movement to Italy has been good over the past few months. Japanese interests are understood to have made inquiry concerning used machinery here recently.

Machinery Sales Still Drag in Middle West

CHICAGO—No change has been reported in the inactivity which has characterized this market for the past several weeks. Many sellers are of the opinion that business cannot become much worse and that, therefore, the next move must be upward. The railroad lists still are outstanding, but it is believed that when some of the grain crops begin to move this buying may be completed. In many offices the opinion is being expressed that the last half of 1938 will compensate to a considerable degree for the slackness of the present period.

Inquiries at High Level But Action Is Slow

CINCINNATI—Inquiry for machine tools is unabated in this area, with a good portion believed to be sincere. The trade generally feels that restriction of appropriations is the sole deterrent to closing on quotations and that the bulk of requests represent actual potential business. New business during the past week held stolidly to recent levels, with foreign demand still aggressive. Domestic ordering is so widely scattered that little or no trend is discernible. Market feeling is still optimistic with forecasts of a rise in demand early in the fall. Normal late spring indications of the usual

summer lull are lacking, and this gives rise to belief that present demand is likely through the summer.

Factories are operating conservatively. Average production is in the neighborhood of about 30 per cent with work weeks less than 40 hr. to allow distribution of employment.

Murray Corp. Developing A New Car

DETROIT—Machine tool representatives in Detroit were unable to confirm rumors that a French interest and the Crosley Radio interests were investigating the manufacture of low-priced, light-weight cars. Real interest attaches, however, to the known fact that Murray Corp. is developing a new automobile and

Exide Celebrates 50th Anniversary

ELECTRIC STORAGE BATTERY CO., Philadelphia, manufacturer of Exide batteries, in June will observe the 50th anniversary of its founding in a one-floor brick structure near Gloucester, N. J. In 1911, according to the company, the first stock automobile to have an electric self-starter made its first appearance equipped with an Exide battery, now produced for many uses in many industries.

Inland Group Claims NLRB Helps Aliens

CHICAGO.—The Steel Workers Independent Union, Inc., Indiana Harbor, Ind., last week attacked the action of the National Labor Relations Board in the Inland Steel Co. case. Members of this independent group, according to their president, D. R. McDewitt, "believe that the NLRB had decided long in advance of any testimony what its decision in the Inland case would be."

The independent union, citing re-

has already talked with some of the automotive suppliers about it. For the most part, very little machine tool activity is reported in the automobile industry.

Firms With U. S. Contracts Buying in the East

NEW YORK—There has been a noticeable pickup in buying activity since the first of the month, but the upturn represents coincidental buying from narrowly restricted sources rather than pointing a trend. Most of the concerns which have purchased machine tools are those that are heavily occupied with Government contracts of one kind or another. The two principal aircraft engine builders head the list, and one of the local shipyards that has been busy with Navy work and was recently awarded contracts for four of the Maritime Commission boats bought two lathes, two radial drills and a shaper, the first activity of this kind in many years. A car shop that received a large boxcar order last month also bought a machine. Otherwise there is still a marked tendency to put off commitments at this time, and no buying on the part of general industry is looked for until the Administration's policies are clarified.

Foreign inquiry has increased. Some of this is coming from Great Britain and Russia and some from Chinese sources. The questions of credit and delivery are so clouded, however, that no one is looking for immediate orders from the last named.

cent decisions of the Board where aliens were ordered back to work after evidence of subversive activity, announced that it is "seriously considering launching an investigation of those aliens' possible communistic and destructive connections."

Labor Gets More Of Steel Sales Dollar

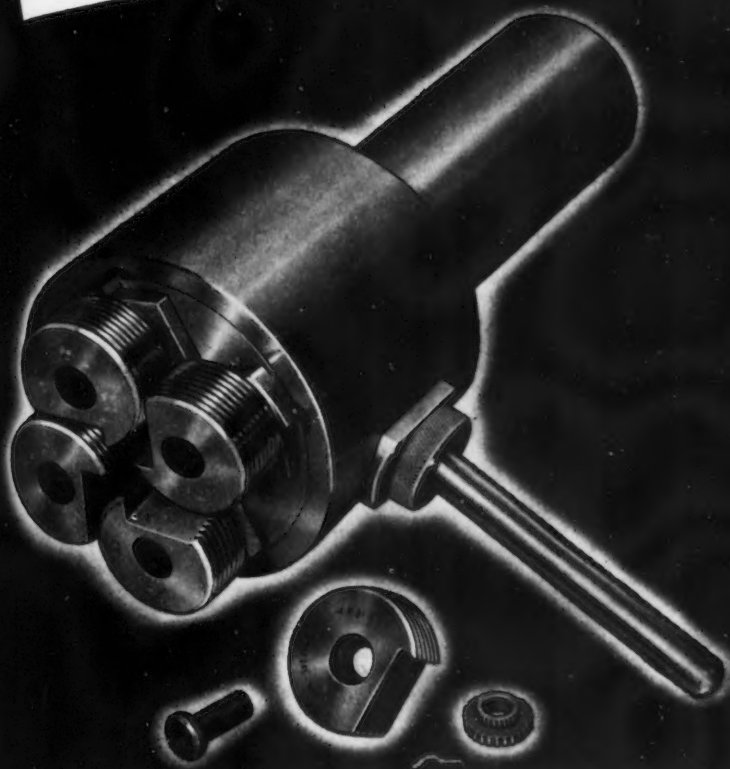
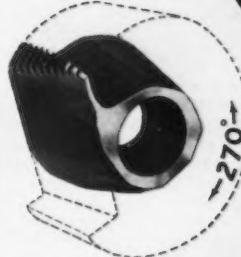
LABOR'S share of the steel industry's sales dollar was five times as large as the share paid stockholders and added to earned surplus during 1937, while only 2.5 times as large in 1929, the American Iron and Steel Institute reports in a steel sales dollar breakdown which shows:

	1937	1929
Into employees' pay envelopes	37.0c.	35.5c.
Added to earned surplus	2.5c.	9.0c.
Into dividend checks	5.0c.	6.5c.
For taxes	5.5c.	4.0c.
Materials, misc. costs	44.0c.	38.5c.
Interest on bonds	1.0c.	1.5c.
Depreciation	5.0c.	5.0c.

Easton Car & Construction Co., Easton, Pa., has moved its New York office to Hudson Terminal, 50 Church Street, under management of Alfred L. Schuller.

**270° of
CHASER
GRIND**

is Real Economy



WITH THESE Namco circular chaser type die heads you grind and regrind to a full 270° chaser circumference. This turns never less than 10 times the of ordinary chasers. ♦ You remove 4 chasers in 40 seconds, and after each grind you reset them "dead accurate" as quickly. This turns a large of normally allowed idle into productive time. ♦ And

with Namco design simplicity, ruggedness and precision as fine as modern equipment affords, you can be certain that threads cut after your last grind will be identical with the first—you increase speeds and hold accuracy. ♦ If these factors are your measure of REAL THREADING ECONOMY, then all we ask is a chance to prove them on any job, any machine—any time. Write THE NATIONAL ACME COMPANY, Cleveland, Ohio.



REG. U. S. PAT. OFF.

**OPENING DIES AND
COLLAPSING TAPS**

• **ACME-GRIDLEY**

**4-6-8 AND SINGLE SPINDLE
AUTOMATIC SCREW MACHINES**

• **AUTOMATIC CHUCKING MACHINES**

• **THE CHRONOLOG
FOR IDLE TIME CONTROL**

• **"POSITIVE" CENTRIFUGES**

• **SCREW MACHINE PRODUCTS**

• **CONTRACT MANUFACTURING**

NATIONAL ACME

PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

Ecusta Paper Corp., 345 West Fortieth Street, New York, Henry S. Strauss, president, recently organized, has purchased about 225 acres on Davidson River, near Brevard, N. C., for new pulp and paper mill, specializing in production of cigarette paper stocks, using flax straw as raw material. Plant will comprise one and multi-story units, with machine shop, power house, pumping station and other mechanical buildings. Cost about \$2,000,000 with machinery. Bids will be asked soon on general contract. J. E. Sirrine & Co., 215 South Main Street, Greenville, S. C., are consulting engineers. New company will be closely identified with a company in France manufacturing similar product.

Presto Recording Corp., 139 West Nineteenth Street, New York, manufacturer of recording and broadcasting equipment has leased a two-story building at 523-27 Raymond Boulevard, Newark, N. J., for plant.

Signal Corp Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until May 24 for adapters, terminal blocks, insulator jackets, shields, etc. (Circular 205); until May 31 for plugs (Circular 206).

Schenley Products Co., 350 Fifth Avenue, New York, affiliated with Schenley Distillers Corp., same address, plans two-story mechanical-bottling, storage and distributing plant at San Francisco, totaling about 100,000 sq. ft. floor space. Cost over \$150,000 with equipment. San Francisco offices of company are at 451 Montgomery Street.

Dry Cold Refrigerator Co., Inc., 322 Ten Eyck Street, Brooklyn, manufacturer of refrigerator equipment, butchers' fixtures, etc., has leased a one-story building, 50 x 100 ft., at 846-48 Atlantic Avenue, for new plant.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 27 for 1199 seamless steel boiler tubes (Schedule 3524) for Brooklyn Navy Yard; until May 31, hacksaw blades (Schedule 3529) for Brooklyn and Mare Island yards.

National Biscuit Co., 449 West Fourteenth Street, New York, has acquired property at Broadway and Halleck Avenue, Jersey City, N. J., 100 x 160 ft., for new one-story branch plant, including storage and distributing units, for which plans will be prepared at once. Cost over \$125,000 with equipment. Company recently has let general contract to White Construction Co., 95 Madison Avenue, New York, for extensions and improvements in plant at first noted address. Cost over \$50,000. Louis Wirsching, Jr., is company architect.

Quartermaster, West Point, N. Y., asks bids until May 23 for valves, valve parts, stoker and boiler parts, steam traps, couplings, bushings, black wrought iron pipe and other equipment (Circular 955-101).

Star Metal Products, Inc., Elizabeth, N. J., care of Charles Rosenblum, 66 Goldsmith Avenue, Newark, N. J., president, has leased about 8400 sq. ft. in Waverly Terminal Building, North Broad Street, Elizabeth, for new plant for production of light metal stampings and as a general machine works.

Commanding Officer, Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until May 23 for twin ring, plain plug, flush pin assembly and adjustable snap gages (Circular 928), 21 sets of geometric chasers (Circular 929); until May 24, 50,000 lb. commercial brass rod, 50,000 lb. miscellaneous metal for reworking (Circular 917), 250 metal parts assemblies (Circular 934).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 24 for one motor-driven horizontal boring,

drilling and milling machine (Schedule 3528), one motor-driven garnetting machine (Schedule 3505) for Philadelphia Navy Yard.

Atlantic Elevator Co., Inc., D Street and Erie Avenue, Philadelphia, has acquired plant and business of Gurney Elevator Co., Honesdale, Pa., manufacturer of passenger elevators, parts, etc. Plant will be removed to Philadelphia works of purchasing company, where operations will be consolidated and expanded.

International Business Machines Corp. will shortly increase capacity of its main Endicott, N. Y., plant by construction of a machine shop, 160 x 450 ft., three stories.

◀ BUFFALO DISTRICT ▶

Afga Anso Corp., Charles Street, Binghamton, N. Y., manufacturer of cameras, lenses, precision photographic equipment, etc., has asked bids on general contract for four-story and basement addition, 75 x 160 ft. Cost over \$125,000 with equipment. Lockwood Greene Engineers, Inc., 30 Rockefeller Plaza, New York, is architect and engineer.

Curtiss Aeroplane Division, Curtiss-Wright Corp., Vulcan and Kenmore Avenues, Buffalo, has work under way on two one-story additions, primarily for parts production, expanding general capacity in this division. Several such departments will be removed to new structures and vacated space used for extensions in recently formed Curtiss Propeller Division.

◀ NEW ENGLAND ▶

Boston Elevated Railway Co., 31 St. James Avenue, Boston, has let general contract to C. J. Maney Co., 24 Dane Street, Somerville, Mass., for one-story and basement machine shop at Everett, Mass. Cost over \$1,000,000 with equipment. A. J. Blackburn, first noted address, is company architect and engineer.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until June 9 for two variety belt sanders (Circular 242), one motor-driven internal small grinder (Circular 245).

Wilmington Packing Co., New Boston Street, Woburn, Mass., food products, has plans for new one-story packing and canning plant, 60 x 200 ft. Cost over \$60,000 with equipment.

J. L. Hammett Co., 290 Main Street, Cambridge, Mass., manufacturer of school equipment and supplies, has let general contract to J. N. & C. J. Buckley Co., 120 Tremont Street, Boston, for four-story and basement addition, 105 x 180 ft., for storage and distribution. Cost about \$150,000 with equipment.

United Aircraft Corp., Pratt & Whitney Division, South Main Street, East Hartford, Conn., has let general contract to R. G. Bent Co., 93 Edwards Street, Hartford, for extensions and improvements, including one-story addition to test house No. 2.

Atlas Tack Co., Fairhaven, Mass., has taken over plant at 1359 Thomaston Avenue, Waterville, Conn., formerly occupied by Beardsley & Wolcott Mfg. Co., which recently went out of business.

◀ WASHINGTON DIST. ▶

Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., asks bids until May 23 for 100,000 sets of tubular brass rivets (Circular 416); until May 24, 200,000 3/4-in. brass web strap buckles (Circular 418).

Commanding Officer, Coast Artillery School, Fort Monroe, Va., asks bids until May 31 for two toolroom lathes (Circular 208-1).

General Purchasing Officer, Panama Canal, Washington, asks bids until May 25 for 70,000 lin. ft. of flexible copper cord, 5000 ft. of rubber insulated cable, 45,000 ft. of weather-proof resistant wire, 3000 ft. of flexible armored cable, 4000 ft. of apparatus-type cable, 22 pneumatic clipping hammers, five pneumatic drills, three paving breakers, six 35-ton screw jacks, six chipping or scaling hammers, two impact wrenches, one precision pantograph, 20,000 steel track spikes, 6000 lin. ft. of copper wire cloth, 6000 lin. ft. of steel wire cloth, and other equipment (Schedule 3353).

Board of Awards, City Hall, Baltimore, asks bids until May 25 for one-story pumping plant and mechanical-blower station on Patapsco River, 67 x 112 ft., for Bureau of Water.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until May 27 for four ring gear riveting attachments for hydraulic press; four 60-ton hydraulic presses with rack and pinion attachment; two 15-ton screw type crankshaft straightening presses, with testing V-blocks (Circular 398-146); five bus and truck type, twin post, pneumatic lifts (Circular 398-147); until June 1, 209 7-ton automobile and motor truck jacks, 15 10-ton roller car-type hydraulic jacks, six 7-ton push and pull-type hydraulic jacks, 75 oxy-acetylene cutting and welding torches (Circular 398-152).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 24 for drill chucks (Schedule 3451) for Brooklyn, Mare Island and Puget Sound Navy Yards; carbon and high speed twist drills (Schedule 3442), iron wire and cable, and copper wire (Schedule 3463), steel cadmium-plated hooks and washers (Schedule 3462); until May 27, steel forgings (Schedule 3523), high-pressure globe and angle valves (Schedule 3503) for Eastern and Western yards.

◀ SOUTH ATLANTIC ▶

Salisbury Coca-Cola Bottling Co., Salisbury, N. C., has let general contract to Southeastern Construction Co., 218 West Second Street, Charlotte, N. C., for new two-story and basement mechanical bottling plant, 167 x 200 ft., near city limits. Cost close to \$100,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 27 for 12 pneumatic grinders (Schedule 3535) for Charleston, S. C., Navy Yard.

Ethyl-Dow Corp., Wilmington, N. C., has awarded contracts to Austin Co., Cleveland, for an addition to its sea-water bromide plant at Kure Beach, 18 miles from Wilmington. Cost about \$2,500,000. Plant produces ethylene bromide from bromide extracted from sea water and prepares it for use in anti-knock motor fuels.

◀ SOUTH CENTRAL ▶

City Council, Natchez, Miss., has let general contract to B. L. Knost, Pass Christian, Miss., for one and two-story industrial building of about 200,000 sq. ft. of floor space, at \$272,456, including steel tanks, power house, stack, boiler unit, etc. Structure will be occupied under long-term lease by Armstrong Rubber Co., West Haven, Conn., for production of automobile tires for Sears, Roebuck & Co., Chicago, which is financially interested in project. Machinery installation will cost approximately \$1,000,000. James T. Canizaro, Lampton Building, Jackson, Miss., is architect; Roberts & Schaefer, 400 North Michigan Avenue, Chicago, are consulting engineers.

Purchasing and Contracting Officer, Quartermaster Corps, Fort McClellan, Ala., asks bids until May 31 for one portable electric motor-driven conveyor, scraper type, 18-in. by 25 ft. long (Circular 533-25).

Tennessee Coal, Iron & Railroad Co., Birmingham, plans extensions and improvements in Docena coal-mining properties, including installation of coal-mining machinery, rotary pumping equipment, scales and accessory

New

INDUSTRIAL LITERATURE

PIPE WELDING.—Metal & Thermit Corp., 120 Broadway, New York. Bulletin No. 20, devoted to the arc welding of high-pressure, high-temperature piping. Topics include selection of pipe materials, electrodes, weld design, welding procedure, preheating, stress relieving, weld testing, and the qualification of welding processes and of operators.

WELDING RODS.—American Brass Co., 25 Broadway, New York City. Illustrated booklet contains information on Tobin bronze, Everdur, manganese bronze, copper, super-nickel and other alloy welding rods for electric and gas welding. A conversion table of melting points and temperature colors of commonly used metals and alloys is included.

FLOODED ELECTRIC EQUIPMENT.—General Electric Co., 1 River Road, Schenectady, N. Y. A valuable little booklet, No. GEA 2571B, that contains comprehensive instructions concerning procedure for reconditioning of flooded electric equipment and will undoubtedly be of interest to all electrical engineers.

SLAG REMOVAL.—Crowe Engineering Co., 309 West Third Street, Cincinnati. Folder describes the Crowe patented auxiliary slag pocket that permits the removal of slag without shutting the furnace down. Photographs show the removal of 40 tons of slag in one piece and the method of using the pocket.

ELECTRIC HOISTS.—Northern Engineering Works, 210 Chene Street, Detroit. Bulletin H-104 illustrates some of the many types of Hi-Lift electric hoists built by the company. The hoists are shown in service in various industries and the various specialized controlling devices employed are pointed out.

PORTABLE HEAT-TREATING FURNACES.—W. S. Rockwell Co., 50 Church Street, New York. Circular describes oil fired portable heat treating and carburizing furnaces of the enclosed front type suitable for annealing, hardening, drawing, carburizing, etc. Sizes and operating data are listed in tabular form.

SAND BLAST GUNS.—Michiana Products Corp., Michigan City, Ind. Pamphlet describes a sand blast gun of unusual design that is said to require only 60 per cent as much air from the air line as does the conventional circular orifice gun. Besides descriptive text, the pamphlet includes a series of photographs showing the gun in operation and illustrating the surface of products cleaned with this gun.

FLANGED SNAGGING WHEELS.—Abrasive Co., Tacony & Fraley Streets, Philadelphia. Folder announces a new development in foundry and billet snagging grinding wheels—a circular steel flange permanently embedded into the side of the wheel immediately adjacent to and surrounding the center hole and lining a portion of it. Flange is said to save wear on mount center and to simplify mounting of the wheel. Recommendations for grinding various types of metals are included.

RE-BUILT MACHINE TOOLS.—Simmons Machine Tool Corp., Troy Road, Albany, N. Y. Methods and equipment employed in rebuilding machine tools are described and illustrated in this catalog. Publication also contains a listing of rebuilt machines, motors and attachments that are immediately available.

PUMPS.—Vickers, Inc., 1402 Oakman Blvd., Detroit. Bulletin gives performance curves, sectional views and blueprints of six types of vane type constant delivery rotary pumps, available in capacities of 2, 3, 5, 8 and 11 gal. per min.

SPEED REDUCERS.—W. A. Jones Foundry & Machine Co., 4401 Roosevelt Avenue, Chicago. A 127-page book covering herringbone speed reducers. Book contains rating tables, service factors and numerous illustrations of the application of these reducers, and has a section devoted to the selection of re-

ducers that contains much data of value to plant engineers.

of both high strength and free machinability can be produced. Stressproofed stocks are said to carry an extra substantially lower than the heat treating extra. Physical and chemical characteristics of Stressproofed steel are listed.

TURBO BLOWERS.—Allis-Chalmers Mfg. Co., 1126 So. 70th St., Milwaukee, Wis. Bulletin No. 1911 describes single stage turbo blowers of the overhung, pedestal and double inlet types, built in capacities from 600 to 10,000 cu. ft. per min. These machines may be driven by electric motors, steam turbines or through speed reducers and are applicable to blowing cupolas, exhausting gases, scavenging diesel engines, etc.

MILLING CUTTERS.—Gairing Tool Co., 1635 W. Lafayette Blvd., Detroit. Folder sets forth the claimed advantages of the new Gair-Lox method of locking blades in cutter housing. Sketches show the details of this method and tables give prices on various types of face mills equipped with this device.

PRESS CONTROL.—Tomkins-Johnson Co., 617 No. Mechanic St., Jackson, Mich. Bulletin No. 3 covers air operated remote control valve systems designed to promote the safe operation of presses. Principles of operation are discussed in detail and attachments for both pressure and exhaust types are illustrated.

ROTARY BLOWERS.—Roots-Connersville Blower Corp., Connersville, Ind. Bulletin 21-b-19 discusses the characteristics of air movement by rotary positive blowers and provides data on capacities, speeds, etc. It is claimed these blowers deliver a flow of air that is steady and free from objectionable pulsation, and may be used directly from the blower without an expansion tank or receiver.

CRANE WHEELS.—Farrell-Cheek Steel Foundry Co., P. O. Box 721, Sandusky, Ohio. Booklet describes crane wheels cast of Farrell "85" wear resisting cast steel. Reasons for the superiority claimed for these wheels are given, and a number of various industrial products that can be profitably cast of this metal are listed.

GALVANIZING.—American Hot Dip Galvanizers Assn. Inc., 903 American Bank Bldg., Pittsburgh, Pa. Specification sheets and technical data on hot dip galvanizing are contained in this booklet. A list of members of the association is also included.

HIGH SPEED HARDENING.—A. F. Holden Co., 200 Winchester St., New Haven, Conn. Booklet contains the story of a new development in high speed steel hardening of either molybdenum or tungsten steels. The method is called the Holden Ceramic Pot method and is explained in detail.

FRACTIONAL HORSEPOWER MOTORS.—Bodine Electric Co., 2254 W. Ohio Street, Chicago. Fractional motors with ratings from 1/2000 to 1/6 hp. are described in this instructive booklet. Mountings, speed reducers, methods of assembly and typical uses are illustrated.

Write for this literature on your company's letter-head. Please mention The Iron Age.

equipment, and about 600 steel mine cars. Cost close to \$200,000 with machinery.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until May 25 for six steel intake gates and frames for three temporary bulkheads for Chickamauga Dam. Intake gates will be about 27 ft. x 19 ft., and weigh approximately 441,000 lb.; temporary bulkheads will weigh about 112,000 lb.

◀ SOUTHWEST ▶

Shell Petroleum Corp., Shell Building, St. Louis, plans rebuilding part of main oil refinery at Roxana, Ill., recently destroyed by fire. Loss over \$500,000 with equipment.

Coca-Cola Bottling Co., Sikeston, Mo., plans new two-story mechanical-bottling plant, 70 x 100 ft. Cost over \$60,000 with equipment.

Southwestern Greyhound Lines, 917 McGee Street, Kansas City, Mo., has leased one-story building, 125 x 200 ft., to be erected at North Kansas City, by North Kansas City Development Co., Railway Exchange Building, Kansas City, for motor bus service, repair and garage building, including machine shop. Cost over \$100,000 with equipment. General contract has been let to Morris-Hoffman Construction Co., Victor Building; George B. Franklin, Reliance Building, is architect, both Kansas City.

Gast Bottling Corp., 851 Hornsby Street, St. Louis, affiliated with Gast Brewery, Inc., same address, has let general contract to Fred L. Flake, 1062 Wall Street, for one-story and basement mechanical-bottling plant, 65 x 115 ft., on adjoining site. Cost close to \$70,000 with equipment. Leonhard Haeger, 3844 Utah Place, is architect.

Quartermaster, Army and Navy General Hospital, Hot Springs, National Park, Ark., asks bids until June 10 for extensions and improvements in power house, including new high-pressure steam boilers and auxiliaries (Circular 400-1).

Continental Supply Co., Continental Building, Dallas, Tex., oil well machinery and other equipment, has plans for initial buildings for new works on Buffalo Bayou, Houston, Tex., where about 10-acre tract was acquired a few months ago. Cost over \$750,000 with equipment. Company is a subsidiary of Youngstown Sheet & Tube Co., Youngstown, Ohio.

◀ WESTERN PA. DIST. ▶

Johnson Bronze Co., Mill Street, New Castle, Pa., manufacturer of bronze bushings, bearings, castings, etc., plans one-story addition, 75 x 145 ft., for production of recently perfected self-lubricating bearings. Cost close to \$50,000 with machinery.

St. Joseph Lead Co., 250 Park Avenue, New York, has plans for extensions and improvements in plant at Josephstown, Pa., on Ohio River, including new loading and unloading docks with mechanical-handling equipment, power plant, conveyor system and other facilities. Cost close to \$150,000 with equipment. W. B. McBride is company engineer.

◀ OHIO AND INDIANA ▶

Firestone Tire & Rubber Co., Akron, Ohio, has acquired plant and business of Andrews-Alderfer Co., Akron, manufacturer of rubber thread and other rubber specialties, and will consolidate with its branch mill at Fall River, Mass., removing plant to that location.

Hobart Cabinet Co., Troy, Ohio, manufacturer of all-steel desks, cabinets, etc., has plans for second-story addition to one-story plant unit on Water Street, 60 x 100 ft. Cost close to \$40,000 with equipment. Pretzinger & Pretzinger, Reibold Building, Dayton, Ohio, are architects.

Contracting Officer, Materiel Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until May 23 for 200 to 600 fuel transfer pump assemblies (Circular 957), 555 automatic mixing control assemblies (Circular

956); until May 24, bank and turn indicators (Circular 959); until May 27, 40 to 70 sets of field testing instrument assemblies (Circular 961).

F. S. Royster Guano Co., Royster Building, Norfolk, Va., commercial fertilizers, has plans for new branch plant at Indianapolis, comprising a main one-story unit, 240 x 480 ft., and about eight auxiliary buildings, including power house, pumping station, machine shop, raw material storage building and other structures. Cost about \$500,000 with equipment. E. C. Doeppers, Law Building, Indianapolis, is engineer; A. L. Griffin is company engineer.

Board of School Trustees, Seventh and Vine Streets, Evansville, Ind., asks bids until May 23 for one-story and basement vocational school, 188 x 250 ft., at Wedeking Avenue and Stringtown Road, including boiler house adjoining. Cost about \$250,000 with equipment. Fowler & Legeman, Central Union Bank Building, are architects. L. B. Putnam is business director.

◀ MICHIGAN DISTRICT ▶

Atlas Crank & Mfg. Co., 4408 Bellevue Avenue, Detroit, manufacturer of automobile carburetor and accelerator rods, etc., has acquired former plant of Ottawa Mfg. Co., Spring Lake, Mich., and will remodel for new works, removing present plant to new location and increasing capacity. Company proposes early change of name to Burnside Mfg. Co., and will begin production at new location in August.

Standard Oil Co., Grand Rapids, Mich., has plans for addition to bulk storage and distributing plant at Battle Creek, Mich., and improvements in present plant. Cost over \$40,000 with equipment.

Construction Service, Veterans' Administration, Washington, asks bids until June 7 for elevated steel tank and tower for institution at Dearborn, Mich.

Ford Motor Co., Dearborn, Mich., has let general contract to Bryant & Detwiler Co., Penobscot Building, for one-story press shop. Cost over \$500,000 with machinery. Albert Kahn, Inc., New Center Building, is architect and engineer. Company also has plans for new hydro electric power station at Milford, Mich., including power dam and generating plant. Cost close to \$100,000 with equipment. Shreve, Anderson & Walker, Marquette Building, Detroit, are architects and engineers.

◀ MIDDLE WEST ▶

Link Belt Co., 307 North Michigan Avenue, Chicago, has asked bids on general contract for one-story addition to branch plant at Indianapolis, 280 x 280 ft. Cost over \$250,000 with equipment. D. A. Bohlen & Son, Majestic Building, Indianapolis, are architects. Indianapolis headquarters of company are at 515 North Holmes Avenue.

Jordan Co., 2630 West Arthington Street, Chicago, manufacturer of acids and other industrial chemicals, has asked bids on general contract for new plant on 12-acre tract at Clarendon Hills, Du Page County, Ill., comprising 12 one-story buildings, with power house, machine shop and other mechanical units. Cost about \$350,000 with equipment. N. Ronneberg, Inc., 10 South LaSalle Street, Chicago, is architect and engineer.

City Council, York, Neb., has engaged Robert Fulton, 2327 South Nineteenth Street, Lincoln, Neb., consulting engineer, to prepare plans for new municipal electric light and power plant. Cost about \$475,000 with equipment. Financing is being arranged.

La Plante-Choate Mfg. Co., Cedar Rapids, Iowa, manufacturer of tractor trailers, steel dump wagons, parts, etc., plans one-story addition. Cost over \$50,000 with equipment.

Globe Oil & Refining Co., Lemont, Ill., plans extensions and improvements in oil refinery, including additional equipment. Cost over \$50,000 with machinery.

Bureau of Reclamation, Denver, asks bids until May 31 for heavy-type oil circuit breakers, disconnecting switches, airbrake

switches and transformers for Seminoe, Greeley, Cheyenne and Rawlins power substations, Kendrick project, Wyo. (Specifications 775).

Ak-Sar-Ben Public Power and Irrigation District, Ashland, Neb., Martin Blum, Ashland, head, now being organized, has plans for hydroelectric generating plant and power dam on Platte River, near South Bend, Neb., with transmission lines. Entire project with irrigation system will cost about \$1,500,000. Financing is being arranged through Federal aid. H. H. Henningson Engineering Co., Union State Bank Building, Omaha, Neb., is consulting engineer.

◀ PACIFIC COAST ▶

Bureau of Yards and Docks, Navy Department, Washington, will secure fund of \$800,000 through annual naval appropriation bill, for new equipment storage and distribution building at Mare Island Navy Yard, including mechanical-handling equipment. An appropriation of \$4,800,000 also is included for new buildings, equipment and facilities to continue development of Naval Air Station, Alameda, Cal.

Old Baldy Citrus Association, 430 East Nineteenth Street, Upland, Cal., has plans for one-story addition to fruit-packing plant, 60 x 160 ft., with facilities for handling 50 railroad cars at one time. Cost about \$65,000 with equipment. W. W. Ache, 301 North Citrus Avenue, Los Angeles, is architect.

Inland Empire Refineries, Inc., 408 Sherwood Building, Spokane, has acquired tract in vicinity of Spokane, for new oil refinery for production of fuel oils, diesel engine oils, lubricating oils, etc., and will begin work at once. Plant will include tank facilities for about 75,000 bbl. at one time. Cost close to \$200,000 with equipment. Emby Kaye is general manager and engineer. Company is a subsidiary of Watsatch Oil Refining Co., Salt Lake City, Utah.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 27 for parts for airplanes (Schedule 900-1745), quantity of parts for airplanes (Schedule 900-1747) for San Diego, Cal., Naval Air Station.

Stauffer Chemical Co., 636 California Street, San Francisco, has plans for one-story branch plant at 3200 East Twenty-sixth Street, Los Angeles, 50 x 100 ft., primarily for a grinding unit. Cost close to \$45,000 with equipment. W. M. Bostock, 6221 Pacific Boulevard, Huntington Park, Cal., is engineer.

Bureau of Reclamation, Sacramento, asks bids until June 2 for warehouse unit at equipment storage yard near Coram, Cal., Kennett Division, Central Valley project (Specifications 784).

Oxnard Road Oil Co., Oxnard, Cal., has approved plans for first unit of new oil refinery, to handle crude oil from Vacca and El Rio oil districts, and will begin work at once. Cost about \$80,000 with equipment, storage tanks and other facilities. Additional units will be built later.

◀ FOREIGN ▶

Imperial Chemical Industries, Ltd., London, England, is concluding arrangements with British War Department for construction of a new plant at Merthyr Tydfil, England, for production of war munitions. Plant will comprise one and multi-story buildings, with power house and other mechanical departments. Cost over \$5,000,000 with machinery.

Melbourne Herald, Melbourne, Victoria, Australia, Sir Keith Murdoch, manager, is at head of a project to build a new pulp and paper mill for production of newsprint for group of daily papers throughout Australia. Proposed mill will use pine wood from Tasmania for pulp wood supply. Plant will comprise several units for pulp and finished paper divisions, with power house, pumping station, machine shop and other mechanical departments. Cost over \$2,000,000 with machinery.

NEW METHOD Eliminates Stress in High Pressure Pipe Welding

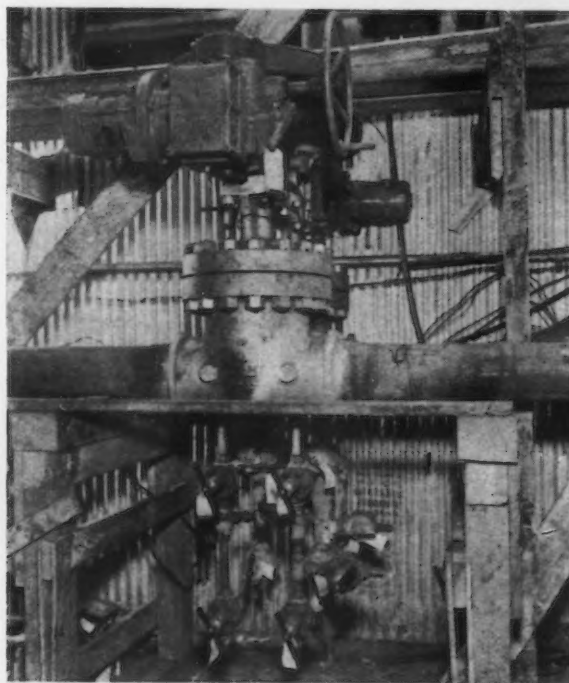
"ELECTRIC ARC" Again Leads The Way

Perfects New Hysteresis Preheating and Normalizing Method. Applicable to valves, crosses, T's, joints close to other pipes and structures, headers, etc.; without limit on connections or different sizes of pipe separately or together.



WELDING MAIN STEAM PIPING—United Engineers and Constructors, Inc., using method at Essex Generating Station, Public Service Electric and Gas Co. of N. J.

You furnish Cables and Wiring. We furnish **Entire Apparatus**. Available by outright purchase or on Reasonable Rental Basis. The rental may apply against purchase price, if desired. Write.



System lends itself to installations such as this involving drip valves, headers, and special connections.

11 Advantages

1. Low Voltage—less than 30 makes for safety.
2. Maximum temperature at weld.
3. Heating by hysteresis loss. Prevents harming weld or parent metal.
4. Requires only one placement and connection of coils to Pipe. Electrical control thereafter. Load coils may be divided on Polyphase.
5. Eliminates stress relieving. Orderly temperature rise and tapering away leaves no strains or stresses in or near weld.
6. Plain stranded bare wire on asbestos—heating medium can be used over and over.
7. Heat in metal of pipe itself not coil.
8. Save test costs as same current can be used for testing welds by Magnaflux process. Defects ascertained before too late.
9. Allows caulking, peening and necessary mechanical work as well as welding to proceed without hindrance.
10. Can be used for bending pipe in field or shop. Also for shrinking, fitting, tempering, hardening or any heat treatment.
11. Maximum speed. Preheating is completed in ten minutes in any size pipe or in any thickness of metal.

NEW, Revised (10th Edition) "Arc Welding Handbook" by C. J. Holslag, just off the press. Contains data on Arc Unionmelt System, Normalizing, Multiple Ring System, Welding of Alloys and Cast Iron, Making Test Pieces, etc. Deluxe Binding, \$2.00 per copy.

ELECTRIC ARC CUTTING & WELDING CO.

SOLE LICENSOR

152 Jelliff Avenue

ALTERNARC
Transformer Welders

DUALARC
Generator Sets

Newark, N. J.

NEWARC
Electrodes and Supplies

5 P. M.—FRIDAY
—AND YOU'VE ENJOYED YOUR WEEK



Vivid and vital each night at 5—after a full day's work. Fresh and alive each Friday at 5—after a full week's work. That's your reward when your office is equipped with Remington Noiseless typewriters. And how important that is to everyone, now that the outdoors beckons.



MAKE THE FIVE O'CLOCK TEST

● The Remington Noiseless works in a whisper—saving nerve strain—eliminating noise strain. Without obligation, make the 5 o'clock test in your office. Use the Remington Noiseless free for this test period. Learn how much more work can be done when nerve shattering typewriter clatter no longer disturbs. See how cheerfully you wind up your busiest days with animation to spare. After all, **typewriter noise** tires you more than office work.

Remington Rand Inc.

BUFFALO, N. Y.

WORLD'S LARGEST MANUFACTURER OF NOISELESS AND PORTABLE TYPEWRITERS



More Remingtons built and sold in 1937 than any other make.

JUST BETWEEN US TWO

Yawnless, Droopless Ex-Mapmaker

THE gentleman gazing impressively at a page layout is your favorite trade paper's art editor, a very pretty but inexact title for one whose main job is taking some 70,000 words each week and arranging them in neat and orderly pages.

Name: Frank Joseph Winters.

Distinguishing characteristic: An incredible resilience. He can stay up until 3 a. m.—working, so he says—and come bouncing in the next morning, pounding his chest like Tarzan, shouting, "Gawd! I feel great!" and what is worse, looking it.

He never yawns. He never droops. He never ambles. It's a brisk heel-and-toe even to the water-cooler.

Frank started life as a mapmaker, which taught him orderliness—placing towns in the right counties—keeping the Great Lakes out of the Rockies—and so on. He can handle the thousand and one details incidental to putting to bed each week a seventy to eighty-page editorial section without missing a dotted eighth note.

He is enthusiastic about everything—even about your ideas—even about those of your ideas that he doesn't like. "Fine idea!" he says. "Too bad it's mechanically impossible. That form closes just too early to do that." And sometimes it's the truth.

He is never tired. He spends Sunday figuring out things to do Monday. He has a thick head of hair. It must have something to do with the glands.



Joke (Stolen)

She: "Sir, I'll have you know I am marrying an engineer and a gentleman."
He: "You can't do that—it's bigamy."

Anniversary

JUST five years ago this column first saw the light of day. Our first item was headed, "Hooray! The Depression is Over—Maybe." We started off with the goal in view of building up an army of eighteen readers, which we attained toward the middle of '37, enabling us since then to rust on our laurels.

Headline Hunter's Hoard

WE think that that new feature on page 54 is an excellent idea, and hope you agree.

Just Put Down the Initial

IT'S funny how secretive some people are about their middle names. If they don't flaunt them for all the world to know, they hide them like a passion for poetry.

So far we have been moderately successful in getting the editors to expose theirs for publication in the X-ray series, and have yet to find anything to be ashamed of—Wesley, Wendell, Joseph, Herbert, Emerson and so on—all very conventional. We are hoping for one with some socko in it.

Ten He Abhors

WILFRED J. FUNK, whose late Literary Digest gave straw voting a rabbit punch, considers these the ten most annoying words: Okay, lousy, terrific, contact, definitely, gal, racket, swell, impact and honey.

The only one of the ten that freezes us is contact. Our list would include factual and reaction. But we'd swallow the lot if a way could be found to shrivel the vocal cords of those who hope to augment their feeble powers of exposition by inquiring at two-minute intervals, "Do you get the picture?"

—A. H. D.